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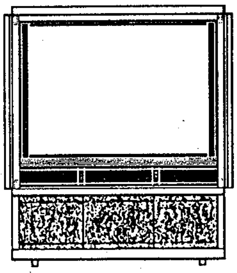
The future of sound and vision.



Service Manual

PROJECTION MONITOR RECEIVER

SD-P502-QD
SD-P502-WD
SD-P452-Q
SD-P452-W

MODELS OF THE FOLLOWING TABLES HAVE TWO VERSIONS :

Type	Applicable model (Appearance is indicated in the ( ).)				Power requirement	Export destination
	SD-P502-QD (oak with door)	SD-P502-WD (walnut with door)	PRO-91 (black without door)	SD-P502-R (chloride vinyl rosewood without door)		
KUX1C	○	○	○	–	AC120V only	U.S.A *1
KC	–	–	–	○	AC120V only	Canada

Type	Applicable model (Appearance is indicated in the ( ).)			Power requirement	Export destination
	SD-P502-H (white without door)	SD-P502-R (melamine rosewood without door)	SD-P502-Q (oak without door)		
KUX1C	○	○	○	AC120V only	U.S.A *1
KC	–	–	–	AC120V only	Canada

Type	Applicable model (Appearance is indicated in the ( ).)				Power requirement	Export destination
	SD-P452-Q (oak without door)	SD-P452-W (walnut without door)	PRO-71 (black without door)	SD-P452-QD (oak with door)		
KUX1C	○	○	○	○	AC120V only	U.S.A *1
KC	–	–	–	–	AC120V only	Canada

*1 ; On KUX1C type
The KUX1C type comes in two versions : the one is manufactured by Harvey Manufacturing, Inc. (having "T" at the end of the serial number), and the other is manufactured by PIONEER ELECTRONICS TECHNOLOGY, INC. (having "L" at the end of the serial number).
Some of the parts of these two versions differ one from the other. For the differences, refer to the notes shown in "EXPLODED VIEWS, PACKING AND PARTS LIST" and "CONTRAST OF MISCELLANEOUS PARTS" of this service manual and the additional service manual.

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- This manual is applicable to the SD-P502-QD/KUX1C, SD-P502-WD/KUX1C, SD-P452-Q/KUX1C and SD-P452-W/KUX1C types.
- See page 104 for details on the SD-P502-WD/KUX1C, SD-P452-Q/KUX1C and SD-P452-W/KUX1C types.
- For the other types, refer to additional service manuals.
- This manual also includes the operating instructions (from page 105).

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1. SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled.
   Keep picture tube away from the body while handling.
2. When service is required, even though the SD-P502-QD an isolation transformer should be inserted between power line and the set in safety before any service is performed.
3. When replacing a chassis in the set, all the protective devices must be put back in place, such as barriers, nonmetallic knobs, adjustment and compartment covershields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead dress.
   Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components.
   Especially critical components as indicated on the circuit diagram should not be replaced by other manufacture's.
   Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced set to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the set by the manufacturer has become defective, or inadvertently defeated during servicing.

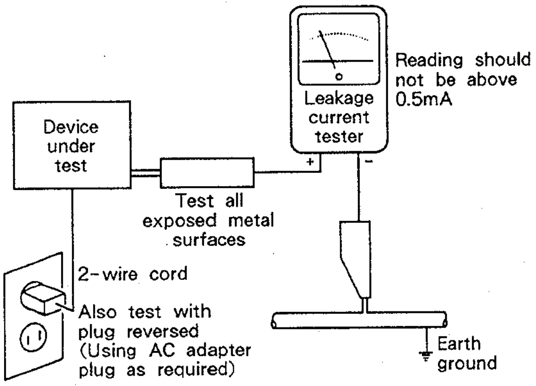
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the 120V AC 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC 500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (input/output terminals, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3MΩ and a maximum resistor reading of 5MΩ. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a 120V AC 60Hz outlet (do not use an isolation transformer for this check). Turn the AC power switch on. Using a "Leakage Current Tester (Simpson Model 229 equivalent)", measure for current from all exposed metal parts of the cabinet (input/output terminals, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5mA .


Reading should not be above 0.5mA
Leakage current tester
+
-
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE SET TO THE CUSTOMER.

High Voltage

This set is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.

Serviceman Warning

In the status of the black picture (video muting is being applied) when no signal is input, high voltage of this set during operation is less than 31.8kV. In case any component having some relation to the high voltage is replaced, confirm that the high voltage is lower than 31.8kV in the status of the black picture when no signal is input.

To measure H.V. use a high impedance H.V. meter. Connect (−) to earth and (+) to the jig.(Refer to page 80.)

X – radiation

TUBE : The primary source of X-radiation in this set is the picture tube.

For continued X-radiation protection, the replacement tube must be the same type as the original, PIONEER approved type.

The picture tube (CRT assembly R, G, B) used in this set holds complete guarantee against X-ray radiation when the X-ray is sealed (See on page 5). Accordingly, when the current in flowing to the picture tube (CRT assembly R, G, B), be sure to perform it by putting the tube into X-ray sealed applied state. Avoid absolutely to flow the current to the picture tube (CRT assembly R, G, B) itself. Moreover, when the voltage of the high voltage circuit becomes abnormally a little higher, the picture tube radiates X-rays. Accordingly, when servicing the high voltage circuit be sure to replace as an assembly with the DEFLECTION assembly (AWV1029) in the manner in which has been adjusted to perform normal operation.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in PIONEER set have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

3. CHARGED SECTION, HIGH VOLTAGE GENERATING POINT AND X-RAY PROTECTION

■Charged section

The circuit in which the commercial AC power is used as it is without passing through the power supply transformer. If the charged section is touched, there is danger of receiving electric shock. In addition, there is the danger of damaging the measuring equipment if it is connected to the GND of the charged section and the GND of the non-charged section while connecting the set directly to the commercial AC power supply. In this case, be sure to connect the set via an insulated transformer and flow the current.

■Charged section (Power supply primary side)

1. The primary side of the DEFLECTION assembly	AWV1029	
2. Power transformer	ATS1148	T1
3. TRANSFORMER PRIMARY assembly	AWZ1952	
4. AC power cord	ADG-089	

▨part is the charged section.

░part is the high voltage generating points other than the charged section.

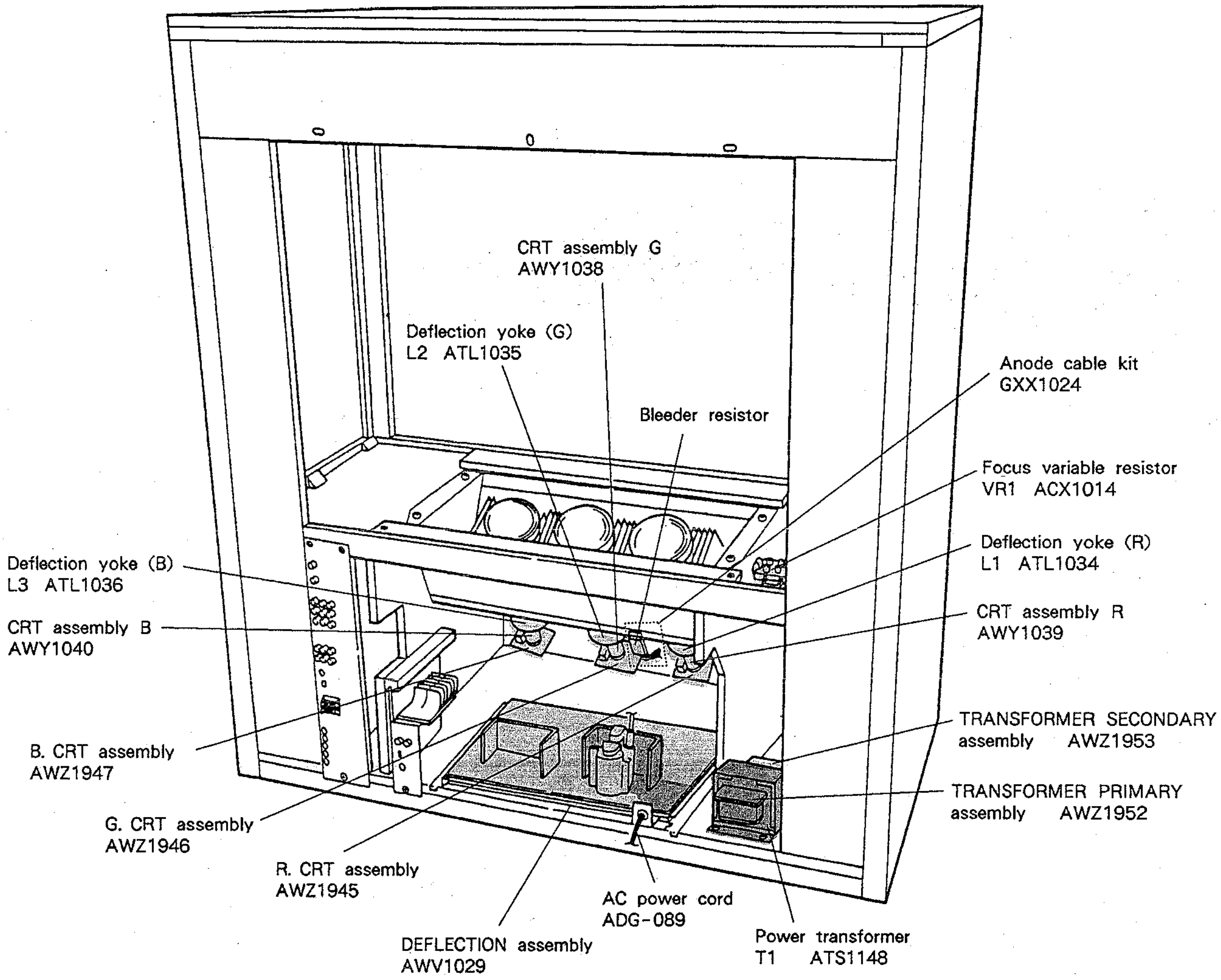

CRT assembly G
AWY1038
Deflection yoke (G)
L2 ATL1035
Bleeder resistor
Anode cable kit
GXX1024
Focus variable resistor
VR1 ACX1014
Deflection yoke (R)
L1 ATL1034
CRT assembly R
AWY1039
TRANSFORMER SECONDARY
assembly AWZ1953
TRANSFORMER PRIMARY
assembly AWZ1952
Deflection yoke (B)
L3 ATL1036
CRT assembly B
AWY1040
B. CRT assembly
AWZ1947
G. CRT assembly
AWZ1946
R. CRT assembly
AWZ1945
AC power cord
ADG-089
DEFLECTION assembly
AWV1029
Power transformer
T1 ATS1148

Fig. 3-1 Charged section and high voltage generating point

■High voltage generating point

The place where voltage of over 100V is generated.

1. Charged section
2. DEFLECTION assembly (including FBT)
   AWV1029 (31.5kV, 160V, 135V, 240V)
3. R CRT assembly
   AWZ1945 (10.5kV)
4. G CRT assembly
   AWZ1946 (10.5kV)
5. B CRT assembly
   AWZ1947 (10.5kV)
6. CRT assembly R
   AWY1039 (31.5kV)
7. CRT assembly G
   AWY1038 (31.5kV)
8. CRT assembly B
   AWY1040 (31.5kV)
9. Focus variable resistor (VR1)
   ACX1014 (10.5kV)
10. Deflection yoke
    ATL1034 (L1 : R)
    ATL1035 (L2 : G) (Approx. 1200V at peak)
    ATL1036 (L3 : B)
11. Anode cable kit (including the breeder resistor)
    GXX1024
12. TRANSFORMER SECONDARY assembly
    AWZ1953

■X-ray protection

- ● Regarding the parts which are relative to radiation of X-rays (There is the danger to radiate X-ray from the individual CRT assembly R, G, B), there are notifications of caution in the individual schematic diagrams. Be sure to read them for safety's sake.
- ● The component parts for X-ray protection are as follows : When the current flows to the CRT assembly R, G, B, be sure to perform it with these parts being attached. Protection from the X-ray radiation is maintained in the state in which these parts have been installed to the CRT assembly R, G, B. Accordingly, be sure to avoid absolutely to flow current only to the CRT assembly R, G, B. Moreover, the anode voltage of the CRT assembly R, G, B should always be kept not higher than the predetermined value (in the minimum brightness and picture state when non signal input is higher than 31.8kV). Be sure to drive the CRT assembly R, G, B by using a completely functional DEFLECTION assembly (AWV1029) which has been adjusted completely in the combined state.(When the voltage abnormally becomes high, the X-ray protection circuit will operate.)

1. CRT assembly R, G, B (Do not dismantle CRT assemblies under any circumstances).
2. Lens assembly 50 (GB), (R)
3. Anode cable kit

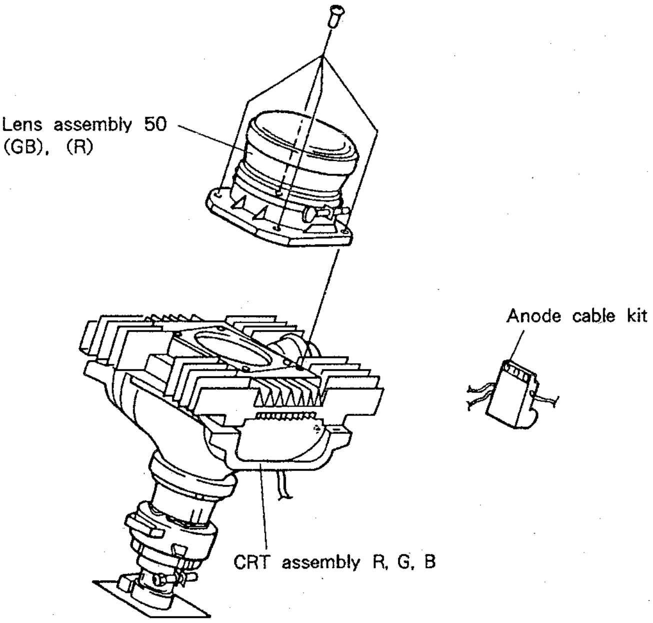


Fig. 3-2 Component parts for X-ray protection

4. EXPLODED VIEWS, PACKING AND PARTS LIST

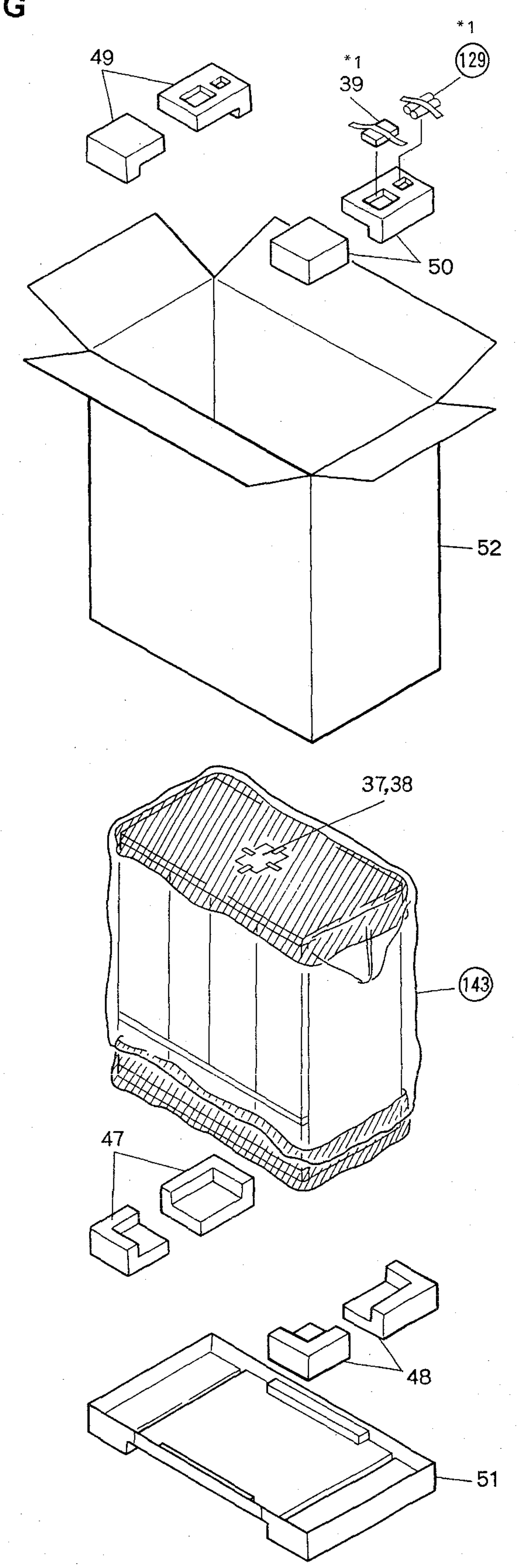
NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- Parts marked by ☆ are important parts which use X − rays.
  If any of these parts need to be replaced, always replace with specified parts.
- Parts having the (T) mark are for the KUX1C type manufactured by Harvey Manufacturing, Inc., and parts having the (L) mark are for the KUX1C type manufactured by PIONEER ELECTRONICS TECHNOLOGY, INC.

4.1 Parts List

Mark	No.	Part No.	Description
	1	AWV1027	VIDEO, TUNER assembly
	2	AWZ1944	CONVERGENCE assembly
	3	AWZ1945	R. CRT assembly
	4	AWZ1946	G. CRT assembly
	5	AWZ1947	B. CRT assembly
	6	AWZ1948	FRONT CONTROL assembly
	7	AWZ1949	RECEIVER assembly
	8	AWZ1950	LED assembly
	9	AWZ1951	FRONT TERMINAL assembly
	10	AWZ1952	TRANSFORMER PRIMARY assembly
	11	AWZ1953	TRANSFORMER SECONDARY assembly
☆	12	AWV1029	DEFLECTION assembly
	13	AWV1030	SURROUND assembly
⚠	14	ACX1014	Focus variable resistor (VR1)
⚠	15	ATL1034	Deflection yoke (R) (L1)
⚠	16	ATL1035	Deflection yoke (G) (L2)
⚠	17	ATL1036	Deflection yoke (B) (L3)
⚠	18	ATS1148	Power transformer (T1)
⚠	19	AEK-119	Fuse (1A, FU602)
⚠	20	AEK-124	Fuse (3.15A, FU603)
⚠	21	AEK-124	Fuse (3.15A, FU604)
⚠	22	AEK-124	Fuse (3.15A, FU605)
⚠	23	AEK-124	Fuse (3.15A, FU606)
⚠	24	AEK-309	Fuse (6.3A, FU601)
	25	AMR1343	Fresnel
	26	AMR1346	Lenticular sheet
	27	AMR1521	Mirror
☆	28	AWL1006	Lens assembly 50 (GB)
☆	29	AWL1007	Lens assembly 50 (R)
	30	AAM1008	Badge
	31	AAN1075	Door assembly
	32	AAP1085	Screen frame H
	33	AAP1087	Screen frame V
	34	AAP1104	Screen frame EH
	35	AMB1358	Front panel assembly
	36	AMB1359	Side panel
	37	ARB1111	Operating instructions (English)
	38	ARB1137	Operating instructions (English)
	39	AXD1054	Remote control unit
	40	AAP1063	Spacer H
	41	AAP1069	Spacer L
	42		• • • • •
	43	AEC-441	Rivet
	44	AEC1011	Screw grommet
	45	ANZ-218	Catcher
	46	APV1012	Speaker
	47	AHA1172	Under pad L
	48	AHA1173	Under pad R
	49	AHA1174	Upper pad L
	50	AHA1175	Upper pad R
	51	AHD1422	Under carton
	52	AHD1423	Upper carton
	53		• • • • •
	54	ABA-115	Screw
	55	ABA1005	Screw
	56	ABA1038	Screw
	57	ABA1040	Screw
	58	ABA1067	Screw
	59	ABA1069	Screw
	60		• • • • •
	61		• • • • •
⚠	62	ADG-089	AC power cord
	63		• • • • •
	64	AMZ40P080FZK	Screw
	65	BBZ30P080FZK	Screw
	66	BYC35P120FZB	Screw
	67	BYC35P160FZK	Screw
	68	BYC40P200FMC	Screw
	69	BYC40P250FMC	Screw
	70	FBT40P120FZK	Screw
	71	ABN-087	Nut
	72	PMB50P250FZB	Screw
	73	VBZ30P060FMC	Screw
	74	VBZ30P080FMC	Screw
	75	VBZ40P080FZK	Screw
	76	VCZ30P060FMC	Screw
	77	VPZ40P160FMC	Screw
	78	AMR1461	Door L
	79	AMR1462	Door R
(T)	80	AMR1256	Caster
(L)	80	AMR1652	Caster
☆	81	AWY1038	CRT assembly G
☆	82	AWY1039	CRT assembly R
☆	83	AWY1040	CRT assembly B
☆	84	GXX1024	Anode cable kit
	85	BYC30P100FMC	Screw
	86	VBZ30P200FMC	Screw
	87	VPZ40P100FMC	Screw
	88	WAXOF160N100	Washer
	89	AEC1133	Screw grommet
(T)	90	ABA1075	Screw
(L)	90	ABA1077	Screw
	91	ANH1166	Shield cover
	92	ACN-186	Wire wound resistor (R303, 2.2/10W)

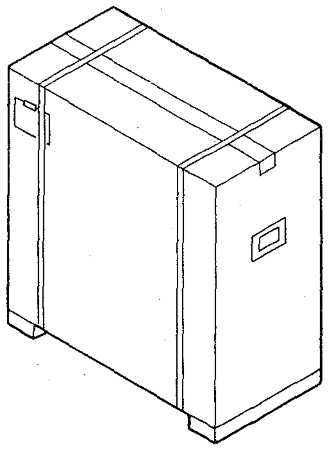
Mark	No.	Part No.	Description
	101		Mirror case
	102		Blind plate
	103		Shield plate
	104		CRT stand
	105		Rear panel
	106		Rear panel S
	107		Cover L
	108		Stay
	109		Holder assembly
	110		AC holder
	111		Holder L
	112		Holder R
	113		Cover
	114		Mirror holder assembly
	115		Holder assembly
	116		Mirror cushion
	117		Cabinet
	118		Grille
	119		Rear cover
	120		Binder
	121		Cable clip
	122		Binder
	123		Cable clip
	124		Stopper
	125		Catch plate
	126		Hinge C
	127		Hinge D
	128		Guide pin
	129		Battery
	130		Frame J
	131		Frame H
	132		Frame I
	133		Stay H
	134		Magnet catch
	135		Butterfly hinge
	136		Top frt filler
	137		Lead clamper
	138		Screw
	139		Screw
	140		Nut M5
	141		Nut M4
	142		Catch B
	143		Packing bag
	144		Binder
	145		Rubber cushion
	146		Spacer
(L)	147		Nut
	148		Washer

4.2 PACKING

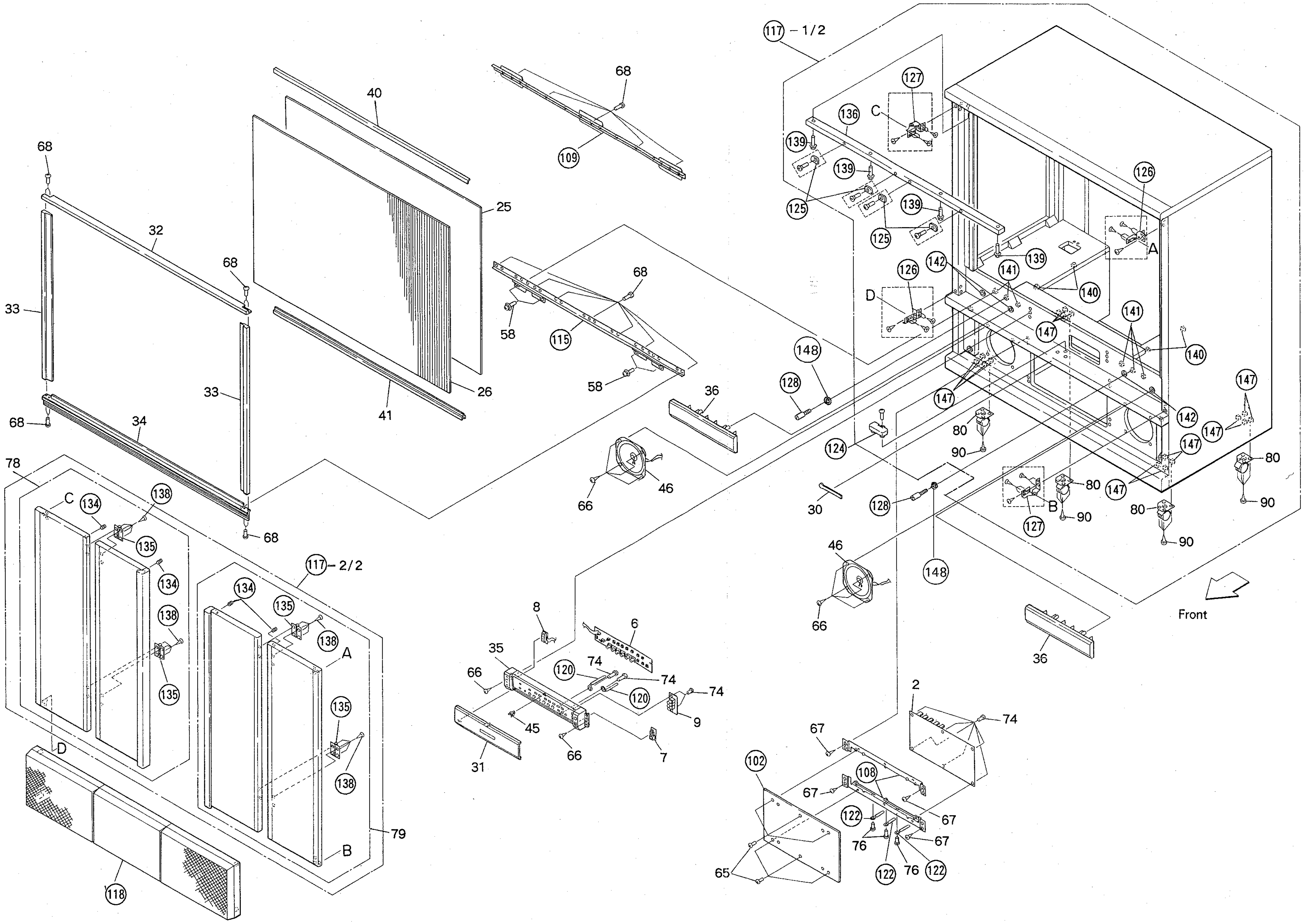


*1 ; Packing Method of Remote control unit and Batteries.

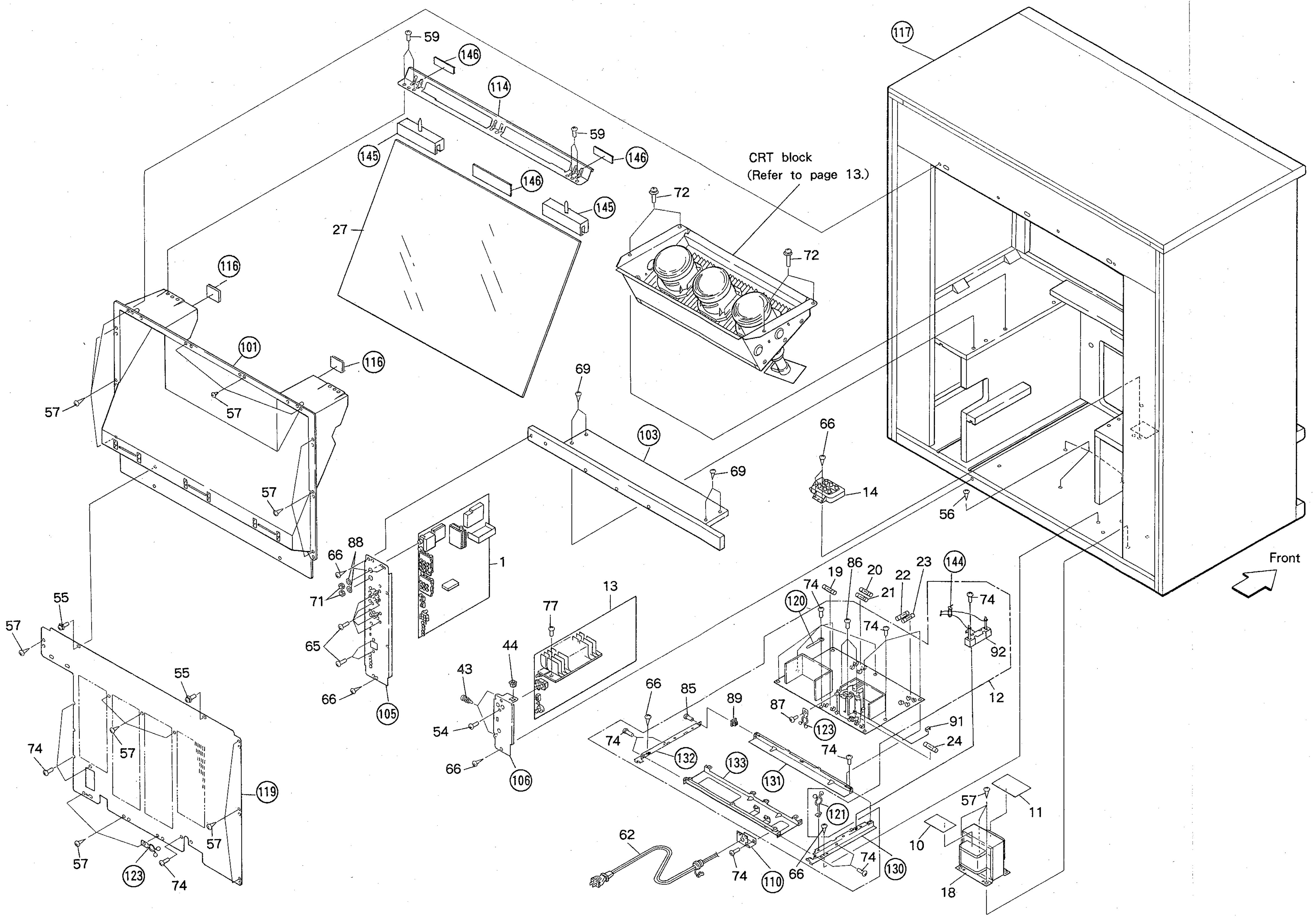
Remote control unit and batteries are packed as shown at left for the version manufactured by PIONEER ELECTRONICS TECHNOLOGY, Inc. They are packed all together and fixed at the back side of TV set with two screws (ABA1040) for the version manufactured by Harvey Manufacturing, Inc.



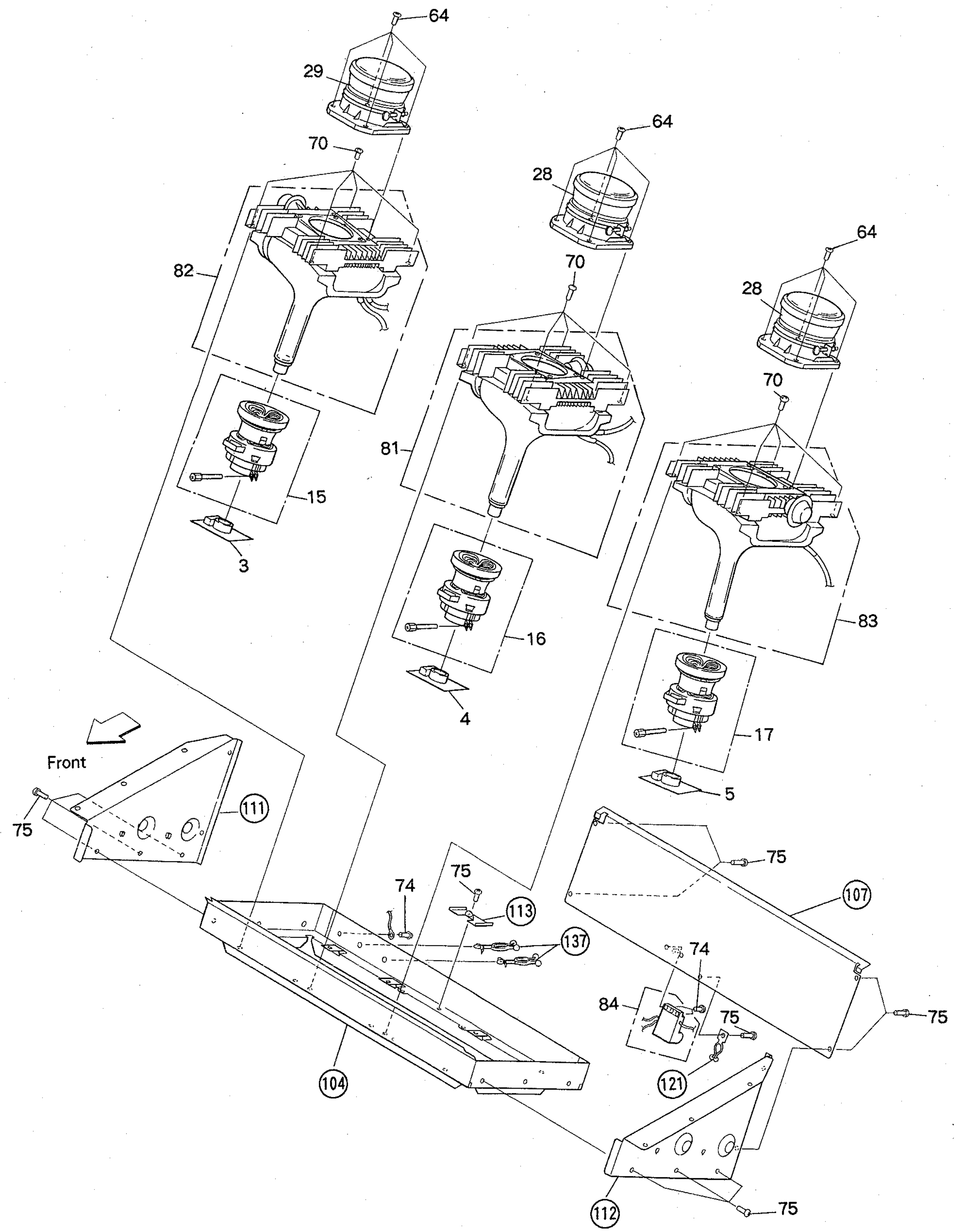
4.3 FRONT VIEW


(117) - 1/2
68
40
109
(127)
C
(136)
(139)
(139)
(125)
(139)
(125)
(126)
A
68
32
25
68
33
33
58
(115)
68
58
26
41
(139)
(126)
D
(142)
(141)
(140)
(141)
(147)
(140)
(148)
(128)
36
(147)
(142)
(147)
68
34
(124)
80
90
(147)
(147)
80
(147)
78
C
(134)
(138)
(135)
(134)
(138)
(135)
46
66
30
(128)
B
80
90
(127)
80
90
90
(117) - 2/2
(134)
(135)
(138)
A
(135)
(138)
79
B
D
(118)
46
66
(148)
Front
8
6
35
66
(120)
74
74
74
(120)
9
45
31
66
7
36
2
74
67
(102)
(108)
67
67
(122)
76
67
65
(122)
76
(122)

4.4 REAR VIEW


A
B
C
D
CRT block
(Refer to page 13.)
Front

4.5 CRT BLOCK



5. SCHEMATIC AND P.C. BOARDS DIAGRAM

1. RESISTORS :
Indicated in Ω, 1/4W, 1/6W and 1/8W, ± 5 % tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ± 1 %, (G) ; ± 2 %, (K) ; ± 10 %, (M) ; ± 20 % tolerance.

2. CAPACITORS :
Indicated in capacity (μ F) / voltage (V) unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :
▭ ; DC voltage (V) at no input signal without notice.
⇐mA ; DC current at no input signal without notice.

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4. OTHERS :
➡ ; Signal route.
⊘ ; Adjusting point.

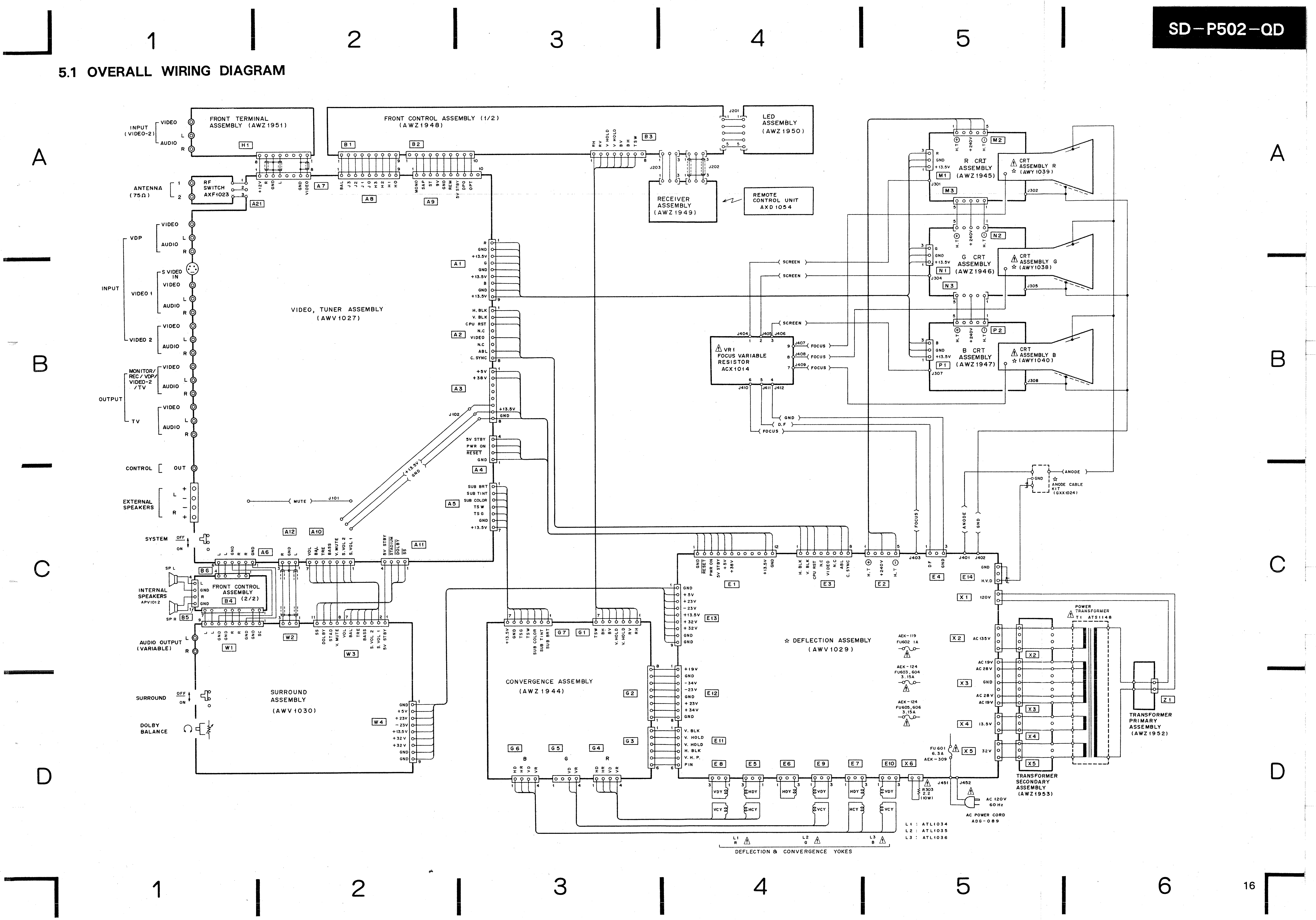
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- ※ marked capacitors and resistors have parts numbers.
- Parts marked by ☆ are important parts which use X-rays. If any of these parts need to be replaced, always replace with specified parts.
- Parts marked by × are important parts which use X-rays. If a failure occurs in any of these parts, replace the printed circuit board assembly where the relevant part has already been adjusted as a working component. Do not replace the actual part itself.
If any part marked by × is replaced, there is danger of being exposed to X-rays.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

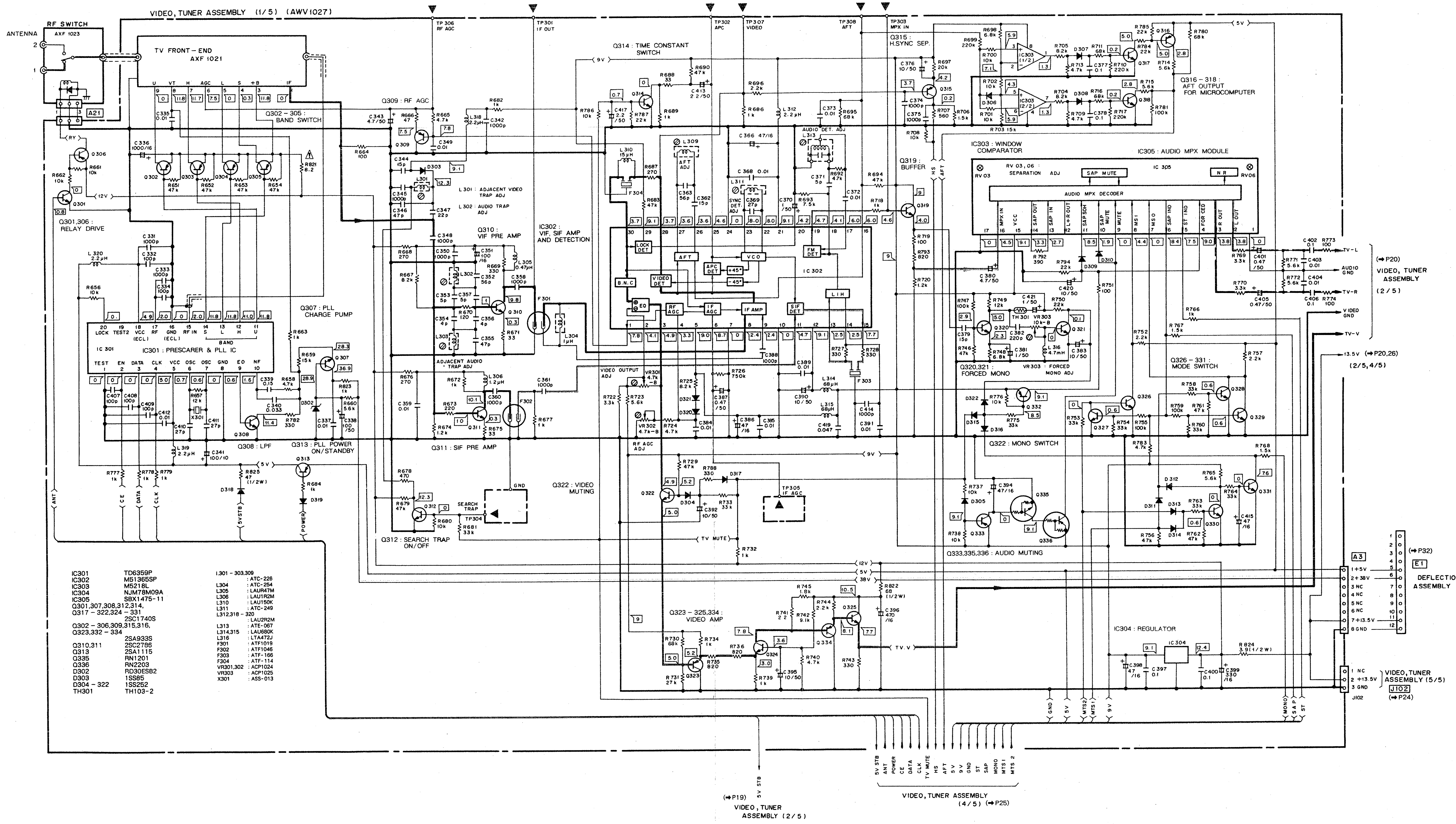
5. SIGNAL RUTE
▨ CHARGED SECTION
——— (VIDEO SIGNAL ROUTE
Y SIGNAL
┈┈┈ COLOR SIGNAL ROUTE
–·–·– AUDIO IF ROUTE
–··–··– AUDIO L CH ROUTE
— — — AUDIO R CH ROUTE
- - - - H. DEFLECTION ROUTE
-·-·-· V. DEFLECTION ROUTE
▨ R. SIGNAL ROUTE
▨ G. SIGNAL ROUTE
▨ B. SIGNAL ROUTE

6. SWITCHES : (The underlined indicates the switch position)
FRONT CONTROL ASSEMBLY
S861 : POWER
S862 : INPUT
S863 : VOLUME +
S864 : VOLUME −
S865 : ADD
S866 : ERASE
S867 : CHANNEL +
S868 : CHANNEL −
S869 : AV MEMORY 1
S870 : AV MEMORY 2
S871 : DPO
S872 : TV − CATV SELECTOR TV − STD − HRC
S873 : TEST ON − OFF
S874 : SPEAKER SELECTOR EXT − INT/SURROUND OFF
VIDEO, TUNER ASSEMBLY
S401 : SYSTEM ON − OFF
SURROUND ASSEMBLY
S451 : BUILT − IN SURROUND PROCESSOR
ON − OFF

5.1 OVERALL WIRING DIAGRAM


FRONT TERMINAL ASSEMBLY (AWZ1951)
H1
FRONT CONTROL ASSEMBLY (1/2) (AWZ1948)
B1
B2
B3
LED ASSEMBLY (AWZ1950)
J201
J202
J203
RECEIVER ASSEMBLY (AWZ1949)
REMOTE CONTROL UNIT AXD1054
RF SWITCH AXF1023
ANTENNA (75Ω)
INPUT (VIDEO-2)
VIDEO
AUDIO
VDP
S VIDEO IN
VIDEO 1
VIDEO 2
INPUT
MONITOR/REC/VDP/VIDEO-2/TV
TV
OUTPUT
CONTROL
OUT
EXTERNAL SPEAKERS
SYSTEM
OFF
ON
VIDEO, TUNER ASSEMBLY (AWV1027)
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A21
J101
J102
MUTE
+13.5V
GND
H. BLK
V. BLK
CPU RST
ABL
C. SYNC
+5V
+38V
5V STBY
PWR ON
RESET
SUB BRT
SUB TINT
SUB COLOR
TSW
TSG
R CRT ASSEMBLY (AWZ1945)
CRT ASSEMBLY R (AWY1039)
M1
M2
M3
G CRT ASSEMBLY (AWZ1946)
CRT ASSEMBLY G (AWY1038)
N1
N2
N3
B CRT ASSEMBLY (AWZ1947)
CRT ASSEMBLY B (AWY1040)
P1
P2
H.T
+240V
SCREEN
FOCUS
VR1 FOCUS VARIABLE RESISTOR ACX1014
D.F
ANODE
ANODE CABLE KIT (GXX1024)
FRONT CONTROL ASSEMBLY (2/2)
B4
B5
B6
INTERNAL SPEAKERS APV1012
SP L
SP R
AUDIO OUTPUT (VARIABLE)
SURROUND
DOLBY BALANCE
SURROUND ASSEMBLY (AWV1030)
W1
W2
W3
W4
CONVERGENCE ASSEMBLY (AWZ1944)
G1
G2
G3
G4
G5
G6
G7
DEFLECTION ASSEMBLY (AWV1029)
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
E12
E13
E14
X1
X2
X3
X4
X5
X6
H.V.D
120V
AC 135V
AC 19V
AC 28V
13.5V
32V
AEK-119 FU602 1A
AEK-124 FU603, 604 3.15A
AEK-124 FU605, 606 3.15A
FU601 6.3A AEK-309
R303 2.2 (10W)
J451
J452
AC 120V 60Hz
AC POWER CORD ADG-089
POWER TRANSFORMER T1 ATS1148
TRANSFORMER SECONDARY ASSEMBLY (AWZ1953)
TRANSFORMER PRIMARY ASSEMBLY (AWZ1952)
Z1
VDY
HDY
VCY
HCY
L1 R
L2 G
L3 B
L1 : ATL1034
L2 : ATL1035
L3 : ATL1036
DEFLECTION & CONVERGENCE YOKES

5.2 TUNER SECTION

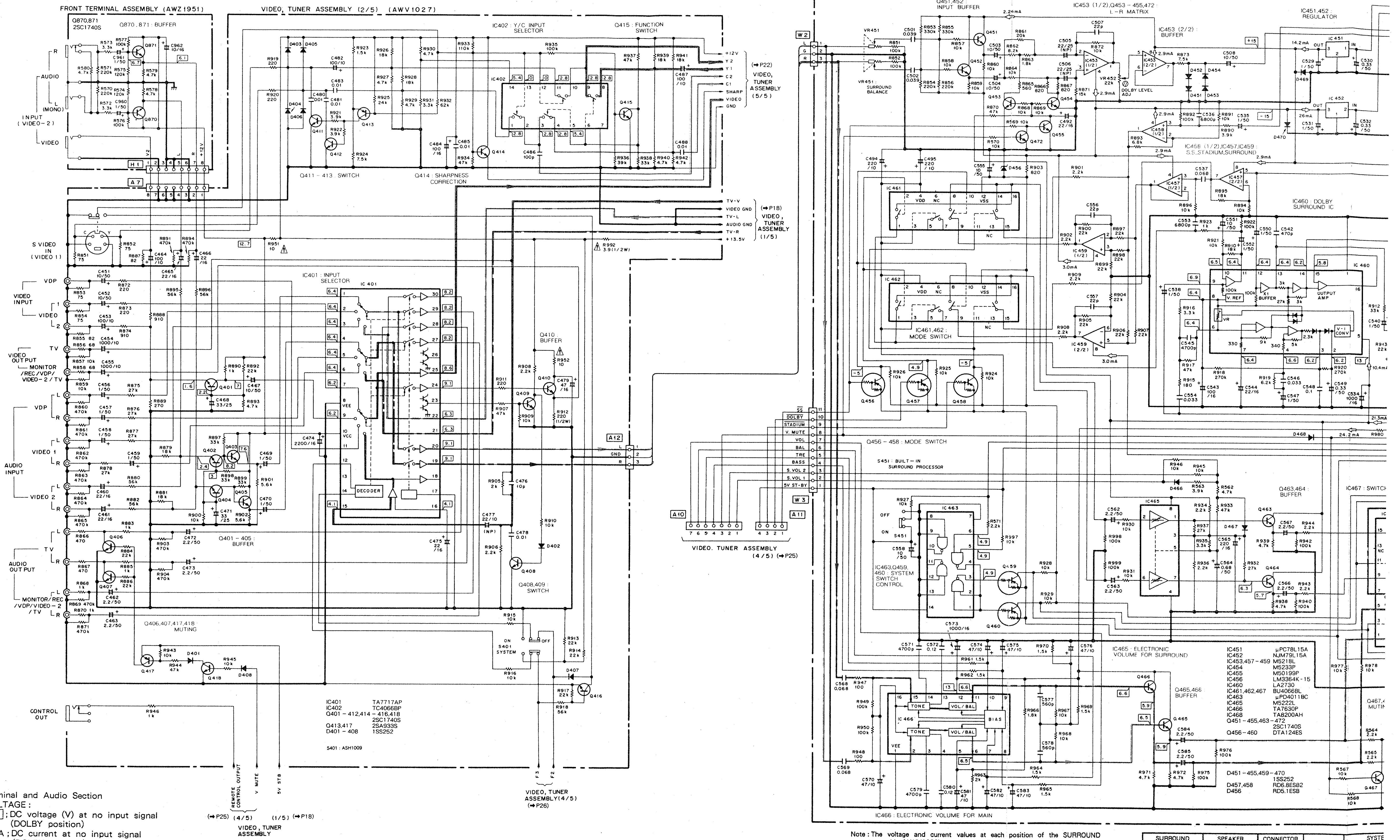

VIDEO, TUNER ASSEMBLY (1/5) (AWV1027)
ANTENNA
RF SWITCH AXF 1023
TV FRONT-END AXF 1021
Q302 - 305 : BAND SWITCH
Q301,306 : RELAY DRIVE
IC301 : PRESCARER & PLL IC
Q307 : PLL CHARGE PUMP
Q308 : LPF
Q313 : PLL POWER ON/STANDBY
Q309 : RF AGC
TP306 RF AGC
TP301 IF OUT
TP302 APC
TP307 VIDEO
TP308 AFT
TP303 MPX IN
TP304
TP305 IF AGC
L301 : ADJACENT VIDEO TRAP ADJ
L302 : AUDIO TRAP ADJ
Q310 : VIF PRE AMP
Q311 : SIF PRE AMP
IC302 : VIF, SIF AMP AND DETECTION
Q312 : SEARCH TRAP ON/OFF
SEARCH TRAP
Q314 : TIME CONSTANT SWITCH
Q322 : VIDEO MUTING
Q315 : H.SYNC SEP.
Q319 : BUFFER
IC303 : WINDOW COMPARATOR
Q316 - 318 : AFT OUTPUT FOR MICROCOMPUTER
IC305 : AUDIO MPX MODULE
AUDIO MPX DECODER
SAP MUTE
N R
RV 03, 06 : SEPARATION ADJ
Q320,321 : FORCED MONO
VR303 : FORCED MONO ADJ
Q326 - 331 : MODE SWITCH
Q322 : MONO SWITCH
Q333,335,336 : AUDIO MUTING
Q323 - 325,334 : VIDEO AMP
IC304 : REGULATOR
VIDEO OUTPUT ADJ
RF AGC ADJ
AUDIO DET. ADJ
AFT ADJ
SYNC DET. ADJ
(→P20) VIDEO, TUNER ASSEMBLY (2/5)
TV-L
AUDIO GND
TV-R
VIDEO GND
TV-V
+13.5V (→P20,26) (2/5,4/5)
(→P32) DEFLECTION ASSEMBLY
VIDEO, TUNER ASSEMBLY (5/5) J102 (→P24)
(→P19) VIDEO, TUNER ASSEMBLY (2/5)
VIDEO, TUNER ASSEMBLY (4/5) (→P25)
5V STB
ANT
POWER
CE
DATA
CLK
TV MUTE
HS
AFT
5V
9V
GND
ST
SAP
MONO
MTS 1
MTS 2
12V
38V

IC301	TD6359P
IC302	M51365SP
IC303	M5218L
IC304	NJM78M09A
IC305	SBX1475-11
Q301,307,308,312,314, Q317 - 322,324 - 331	2SC1740S
Q302 - 306,309,315,316, Q323,332 - 334	2SA933S
Q310,311	2SC2786
Q313	2SA1115
Q335	RN1201
Q336	RN2203
D302	RD30ESB2
D303	1SS85
D304 - 322	1SS252
TH301	TH103-2

L301 - 303,309	: ATC-226
L304	: ATC-254
L305	: LAUR47M
L306	: LAU1R2M
L310	: LAU150K
L311	: ATC-249
L312,318 - 320	: LAU2R2M
L313	: ATE-067
L314,315	: LAU680K
L316	: LTA472J
F301	: ATF1019
F302	: ATF1046
F303	: ATF-166
F304	: ATF-114
VR301,302	: ACP1024
VR303	: ACP1025
X301	: ASS-013

TUNER SECTION
VOLTAGE :
▭ ; DC voltage (V) at 9ch test mode,
MTS : MAIN
ANT : ANT1

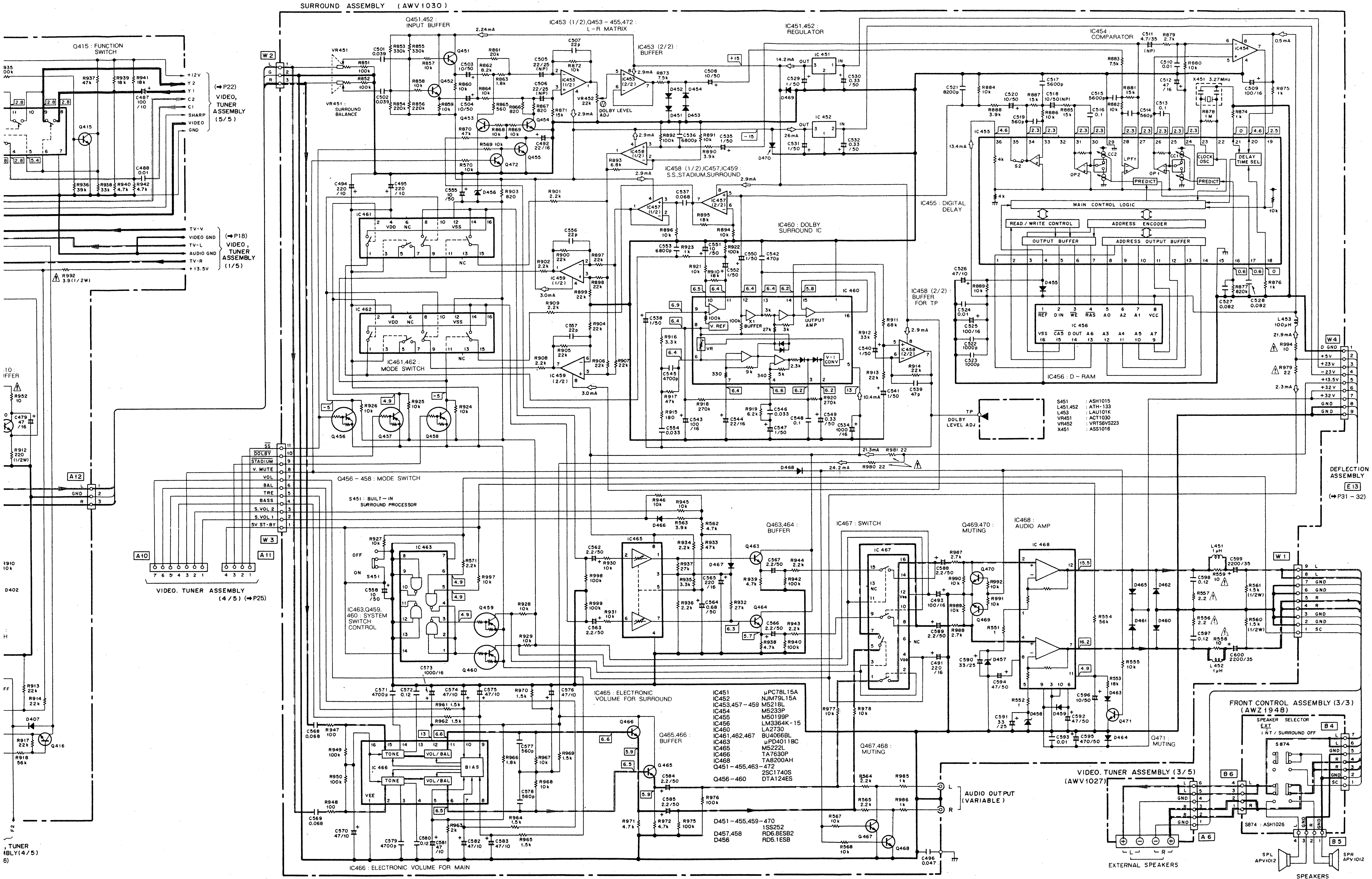
5.3 I/O TERMINAL AND AUDIO SECTION


1
2
3
4
5
6
A
B
C
D
FRONT TERMINAL ASSEMBLY (AWZ1951)
VIDEO, TUNER ASSEMBLY (2/5) (AWV1027)
SURROUND ASSEMBLY (AWV1030)
Q870,871 2SC1740S
Q870,871 : BUFFER
INPUT (VIDEO-2)
AUDIO
R
L (MONO)
VIDEO
S VIDEO IN (VIDEO 1)
VIDEO INPUT
VIDEO OUTPUT
AUDIO INPUT
AUDIO OUTPUT
CONTROL OUT
Q411 - 413 : SWITCH
Q414 : SHARPNESS CORRECTION
IC402 : Y/C INPUT SELECTOR
Q415 : FUNCTION SWITCH
(→P22) VIDEO, TUNER ASSEMBLY (5/5)
(→P18) VIDEO, TUNER ASSEMBLY (1/5)
IC401 : INPUT SELECTOR
DECODER
Q410 : BUFFER
Q401 - 405 : BUFFER
Q406,407,417,418 : MUTING
Q408,409 : SWITCH
S401 SYSTEM
REMOTE CONTROL OUTPUT
V MUTE
5V STB
(→P25) (4/5)
(1/5) (→P18)
VIDEO, TUNER ASSEMBLY
VIDEO, TUNER ASSEMBLY(4/5) (→P26)
IC401 TA7717AP
IC402 TC4066BP
Q401 - 412,414 - 416,418 2SC1740S
Q413,417 2SA933S
D401 - 408 1SS252
S401 : ASH1009
VIDEO, TUNER ASSEMBLY (4/5) (→P25)
Q451,452 : INPUT BUFFER
IC453 (1/2),Q453 - 455,472 : L-R MATRIX
IC453 (2/2) : BUFFER
IC451,452 : REGULATOR
VR451 SURROUND BALANCE
VR452 DOLBY LEVEL ADJ
IC458 (1/2),IC457,IC459 : S.S.,STADIUM,SURROUND
IC460 : DOLBY SURROUND IC
IC461,462 : MODE SWITCH
Q456 - 458 : MODE SWITCH
S451 : BUILT - IN SURROUND PROCESSOR
IC463,Q459, 460 : SYSTEM SWITCH CONTROL
IC465 : ELECTRONIC VOLUME FOR SURROUND
Q463,464 : BUFFER
Q465,466 : BUFFER
IC466 : ELECTRONIC VOLUME FOR MAIN
IC451 µPC78L15A
IC452 NJM79L15A
IC453,457 - 459 M5218L
IC454 M5233P
IC455 M50199P
IC456 LM3364K-15
IC460 LA2730
IC461,462,467 BU4066BL
IC463 µPD4011BC
IC465 M5222L
IC466 TA7630P
IC468 TA8200AH
Q451 - 455,463 - 472 2SC1740S
Q456 - 460 DTA124ES
D451 - 455,459 - 470 1SS252
D457,458 RD6.8ESB2
D456 RD5.1ESB

Terminal and Audio Section
VOLTAGE :
▭ ; DC voltage (V) at no input signal (DOLBY position)
⇦mA ; DC current at no input signal (DOLBY position)

Note : The voltage and current values at each position of the SURROUND assembly (AWV1030) are those while the DOLBY surround function is activated, i.e., with S451 (in AWV1030) at the ON position and S874 (in AWZ1948) at the EXT position. The mode-setting status of the SURROUND system is shown in the table to the right.
However, the signal route is that while the SURROUND system SW (S451) is off.

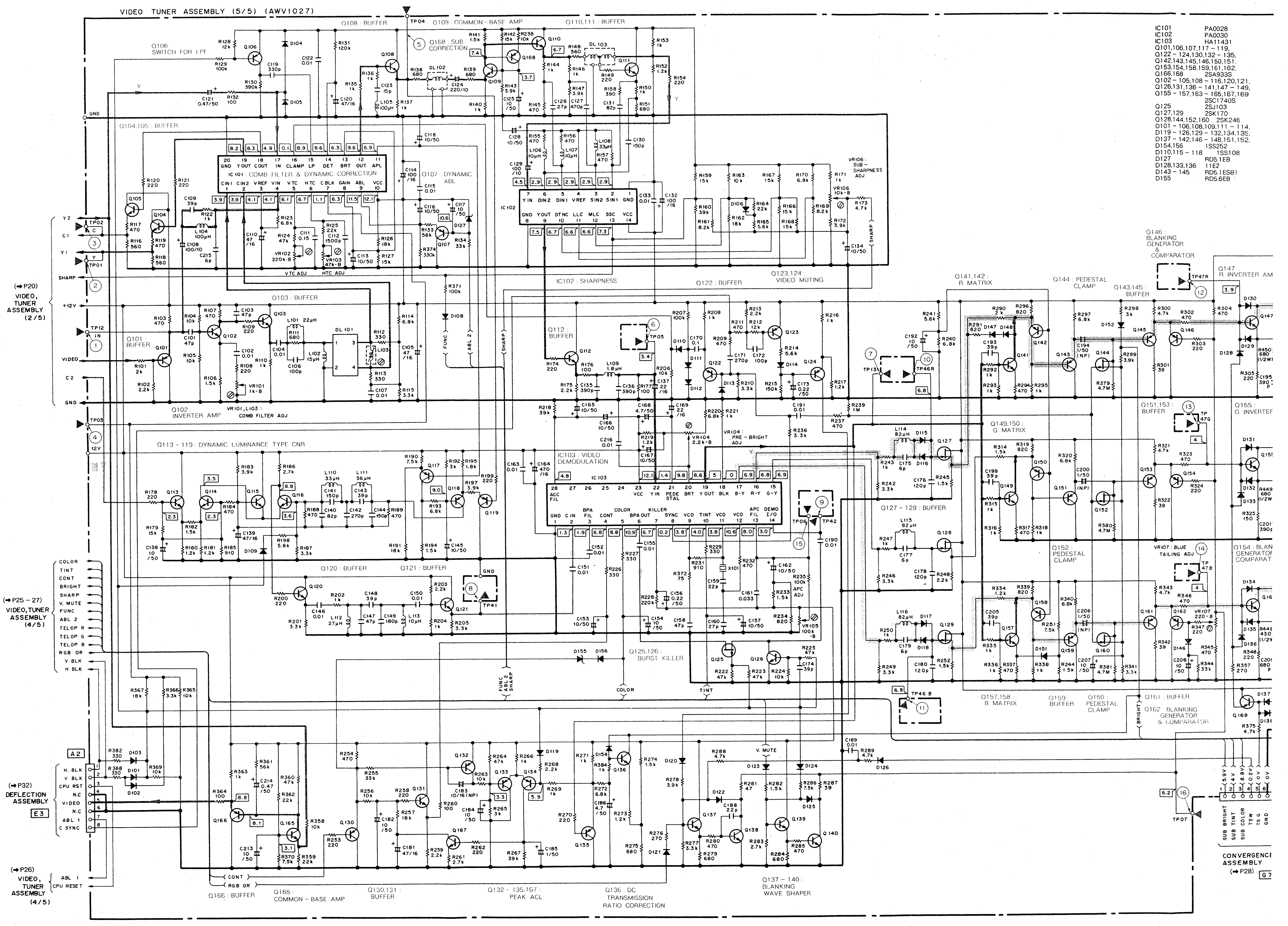
SURROUND SYSTEM SW S451	SPEAKER SELECTOR S874	CONNECTOR B4 SC (PIN1)	SETTING	SYSTE Amp be use
OFF (L)	INT/SURR. OFF	L	NORMAL	FRONT
	EXT	OPEN		FRONT
ON (H)	INT/SURR. OFF	L	SURROUND	FRONT
	EXT	OPEN		REAR


SURROUND ASSEMBLY (AWV1030)
Q451,452 : INPUT BUFFER
IC453 (1/2),Q453-455,472 : L-R MATRIX
IC453 (2/2) : BUFFER
IC451,452 : REGULATOR
IC454 : COMPARATOR
X451 3.27MHz
IC455 : DIGITAL DELAY
MAIN CONTROL LOGIC
READ / WRITE CONTROL
ADDRESS ENCODER
OUTPUT BUFFER
ADDRESS OUTPUT BUFFER
IC456 : D-RAM
IC458 (1/2),IC457,IC459 : S.S.,STADIUM,SURROUND
IC460 : DOLBY SURROUND IC
IC458 (2/2) : BUFFER FOR TP
DOLBY LEVEL ADJ
VR451 : SURROUND BALANCE
VR452 DOLBY LEVEL ADJ
IC461,462 : MODE SWITCH
Q456-458 : MODE SWITCH
S451 : BUILT-IN SURROUND PROCESSOR
IC463,Q459,460 : SYSTEM SWITCH CONTROL
IC465 : ELECTRONIC VOLUME FOR SURROUND
IC466 : ELECTRONIC VOLUME FOR MAIN
Q463,464 : BUFFER
Q465,466 : BUFFER
IC467 : SWITCH
Q467,468 : MUTING
Q469,470 : MUTING
IC468 : AUDIO AMP
Q471 MUTING
AUDIO OUTPUT (VARIABLE)
Q415 : FUNCTION SWITCH
VIDEO, TUNER ASSEMBLY (5/5) (➔P22)
VIDEO, TUNER ASSEMBLY (1/5) (➔P18)
VIDEO, TUNER ASSEMBLY (4/5) (➔P25)
VIDEO, TUNER ASSEMBLY (3/5) (AWV1027)
DEFLECTION ASSEMBLY (➔P31-32)
FRONT CONTROL ASSEMBLY (3/3) (AWZ1948)
SPEAKER SELECTOR EXT INT / SURROUND OFF
S874 : ASH1026
EXTERNAL SPEAKERS
SPEAKERS INTERNAL APV1012
SPL APV1012
SPR APV1012
S451 : ASH1015
L451,452 : ATH-133
L453 : LAU101K
VR451 : ACT1030
VR452 : VRTS6VS223
X451 : ASS1016
IC451 µPC78L15A
IC452 NJM79L15A
IC453,457-459 M5218L
IC454 M5233P
IC455 M50199P
IC456 LM3364K-15
IC460 LA2730
IC461,462,467 BU4066BL
IC463 µPD4011BC
IC465 M5222L
IC466 TA7630P
IC468 TA8200AH
Q451-455,463-472 2SC1740S
Q456-460 DTA124ES
D451-455,459-470 1SS252
D457,458 RD6.8ESB2
D456 RD5.1ESB
W2
W3
W4
A10
A11
A12
A6
B4
B5
B6
E13
4
5
6
7
8
9
A
B
C
D

Note : The voltage and current values at each position of the SURROUND assembly (AWV1030) are those while the DOLBY surround function is activated, i.e., with S451 (in AWV1030) at the ON position and S874 (in AWZ1948) at the EXT position. The mode-setting status of the SURROUND system is shown in the table to the right. However, the signal route is that while the SURROUND system SW (S451) is off.

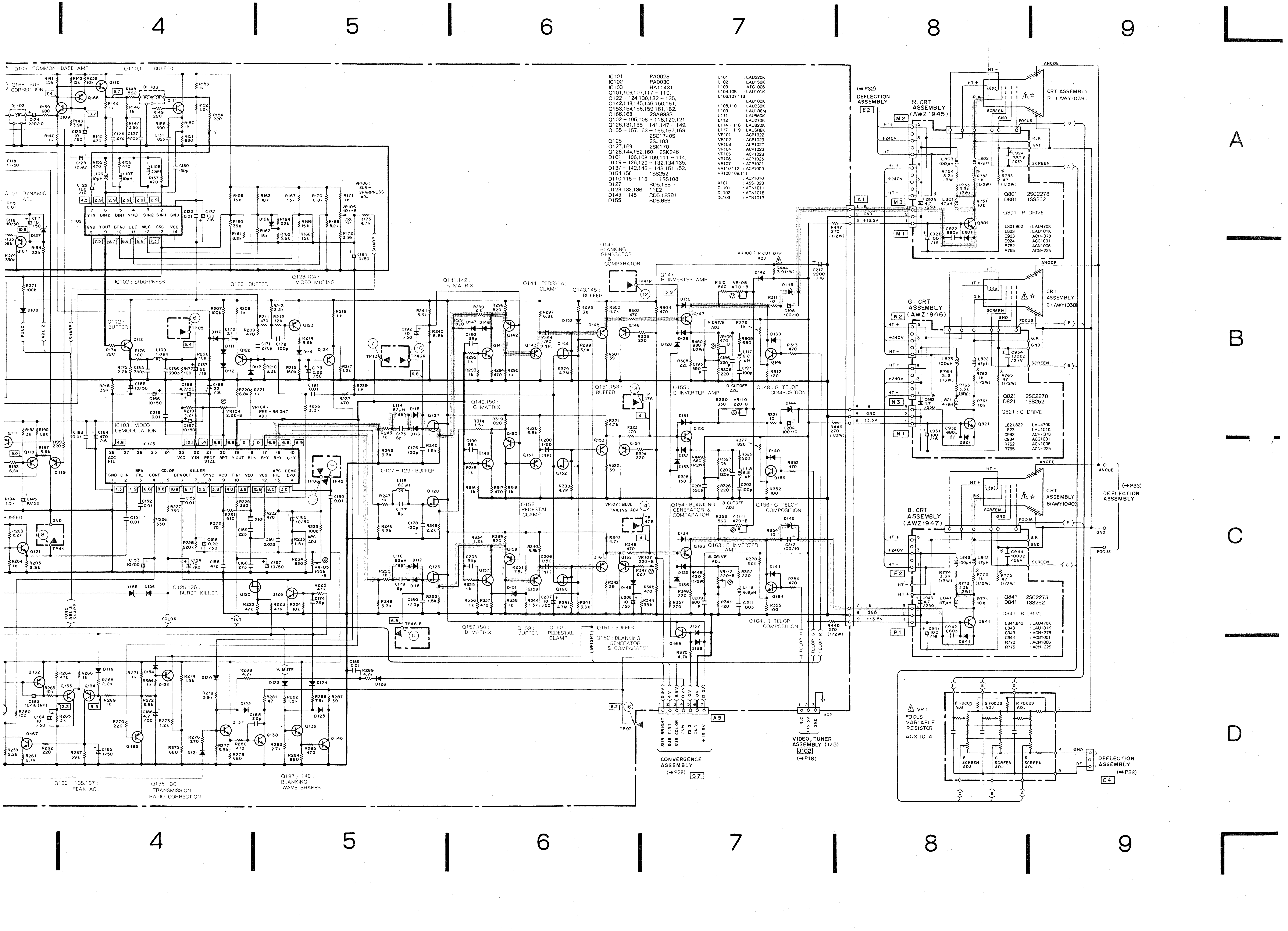
SURROUND SYSTEM SW S451	SPEAKER SELECTOR S874	CONNECTOR B4 SC (PIN1)	SETTING	SYSTEM CONDITION	
				Amp be used	Speaker be used
OFF (L)	INT/SURR OFF	L	NORMAL	FRONT	INT
	EXT	OPEN		FRONT	EXT
ON (H)	INT/SURR OFF	L	SURROUND	FRONT	INT
	EXT	OPEN		REAR	EXT

5.4 VIDEO SECTION

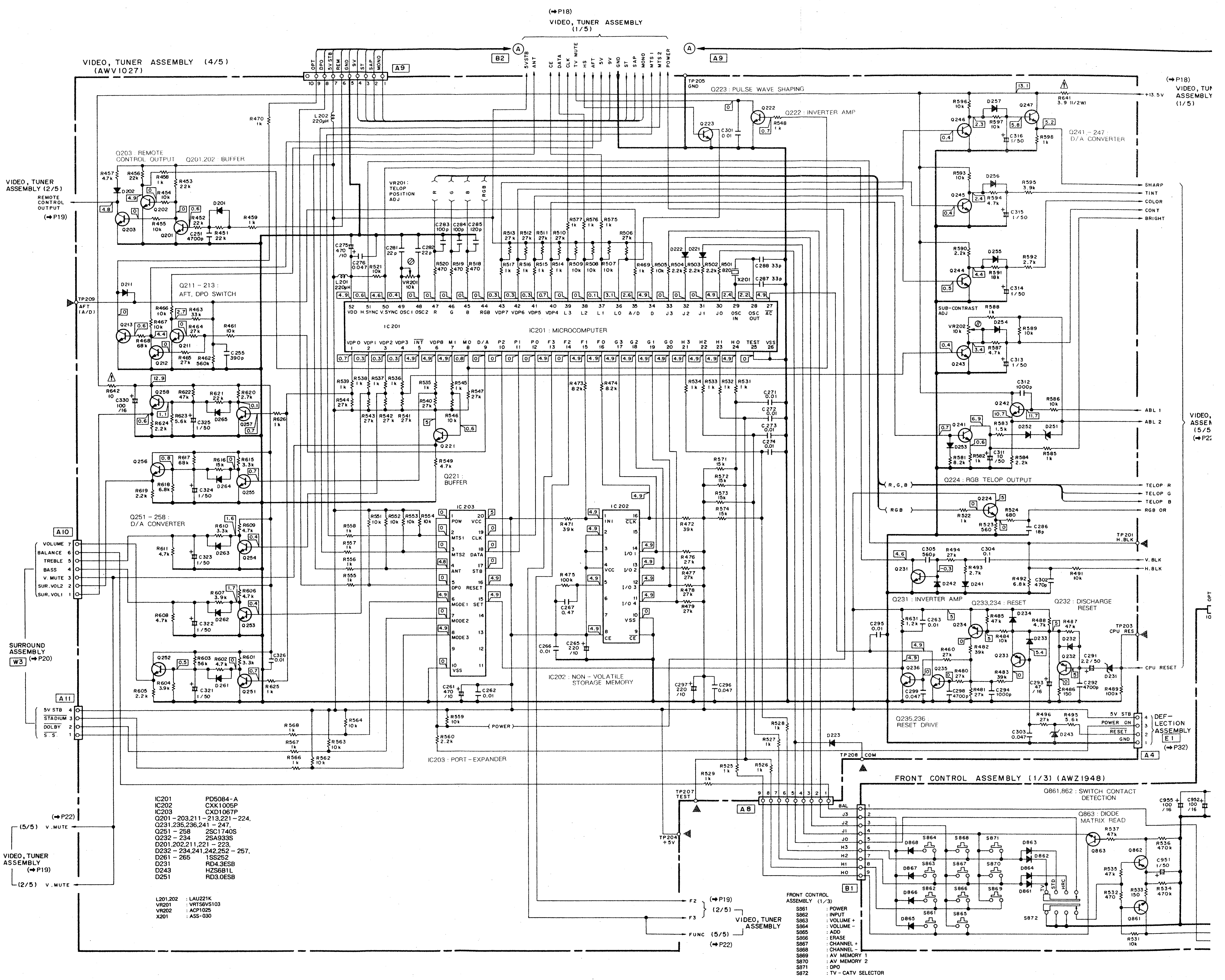


A
B
C
D
VIDEO TUNER ASSEMBLY (5/5) (AWV1027)
Q106 : SWITCH FOR LPF
Q108 : BUFFER
Q109 : COMMON-BASE AMP
Q110,111 : BUFFER
Q168 : SUB CORRECTION
Q104,105 : BUFFER
IC101 : COMB FILTER & DYNAMIC CORRECTION
Q107 : DYNAMIC ABL
IC102
IC102 : SHARPNESS
VR106 : SUB-SHARPNESS ADJ
VTC ADJ
HTC ADJ
(→P20) VIDEO, TUNER ASSEMBLY (2/5)
Q103 : BUFFER
Q101 : BUFFER
Q102 : INVERTER AMP
VR101, L103 : COMB FILTER ADJ
Q112 : BUFFER
Q122 : BUFFER
Q123,124 : VIDEO MUTING
Q141,142 : R MATRIX
Q144 : PEDESTAL CLAMP
Q143,145 : BUFFER
Q146 : BLANKING GENERATOR & COMPARATOR
Q147 : R INVERTER AMP
Q113 - 119 : DYNAMIC LUMINANCE TYPE CNR
IC103 : VIDEO DEMODULATION
VR104 : PRE-BRIGHT ADJ
Q127 - 129 : BUFFER
Q149,150 : G MATRIX
Q151,153 : BUFFER
Q155 : G INVERTER
Q152 : PEDESTAL CLAMP
Q154 : BLANKING GENERATOR & COMPARATOR
VR107 : BLUE TAILING ADJ
Q120 : BUFFER
Q121 : BUFFER
APC ADJ
(→P25 - 27) VIDEO, TUNER ASSEMBLY (4/5)
COLOR
TINT
CONT
BRIGHT
SHARP
V. MUTE
FUNC
ABL 2
TELOP R
TELOP G
TELOP B
RGB OR
V BLK
H BLK
Q125,126 : BURST KILLER
Q157,158 : B MATRIX
Q159 : BUFFER
Q160 : PEDESTAL CLAMP
Q161 : BUFFER
Q162 : BLANKING GENERATOR & COMPARATOR
(→P32) DEFLECTION ASSEMBLY
E3
A2
H. BLK
V. BLK
CPU RST
N.C
VIDEO
N.C
ABL 1
C SYNC
(→P26) VIDEO, TUNER ASSEMBLY (4/5)
ABL 1
CPU RESET
CONT
RGB OR
Q166 : BUFFER
Q165 : COMMON-BASE AMP
Q130,131 : BUFFER
Q132 - 135,167 : PEAK ACL
Q136 : DC TRANSMISSION RATIO CORRECTION
Q137 - 140 : BLANKING WAVE SHAPER
CONVERGENCE ASSEMBLY (→P28)
SUB BRIGHT
SUB TINT
SUB COLOR
TSW
GND

IC101	PA0028
IC102	PA0030
IC103	HA11431
Q101,106,107,117 – 119, Q122 – 124,130,132 – 135, Q142,143,145,146,150,151, Q153,154,158,159,161,162, Q166,168	2SA933S
Q102 – 105,108 – 116,120,121, Q126,131,136 – 141,147 – 149, Q155 – 157,163 – 165,167,169	2SC1740S
Q125	2SJ103
Q127,129	2SK170
Q128,144,152,160	2SK246
D101 – 106,108,109,111 – 114, D119 – 126,129 – 132,134,135, D137 – 142,146 – 148,151,152, D154,156	1SS252
D110,115 – 118	1SS108
D127	RD5.1EB
D128,133,136	11E2
D143 – 145	RD5.1ESB1
D155	RD5.6EB


4
5
6
7
8
9
A
B
C
D
IC101 PA0028
IC102 PA0030
IC103 HA11431
Q101,106,107,117 – 119,
Q122 – 124,130,132 – 135,
Q142,143,145,146,150,151,
Q153,154,158,159,161,162,
Q166,168 2SA933S
Q102 – 105,108 – 116,120,121,
Q126,131,136 – 141,147 – 149,
Q155 – 157,163 – 165,167,169
2SC1740S
Q125 2SJ103
Q127,129 2SK170
Q128,144,152,160 2SK246
D101 – 106,108,109,111 – 114,
D119 – 126,129 – 132,134,135,
D137 – 142,146 – 148,151,152,
D154,156 1SS252
D110,115 – 118 1SS108
D127 RD5.1EB
D128,133,136 11E2
D143 – 145 RD5.1ESB1
D155 RD5.6EB
L101 : LAU220K
L102 : LAU150K
L103 : ATG1006
L104,105 : LAU101K
L106,107,113 : LAU100K
L108,110 : LAU330K
L109 : LAU1R8M
L111 : LAU560K
L112 : LAU270K
L114 – 116 : LAU820K
L117 – 119 : LAU6R8K
VR101 : ACP1022
VR102 : ACP1029
VR103 : ACP1027
VR104 : ACP1023
VR105 : ACP1028
VR106 : ACP1025
VR107 : ACP1021
VR110,112 : ACP1009
VR108,109,111 : ACP1010
X101 : ASS-028
DL101 : ATN1011
DL102 : ATN1018
DL103 : ATN1013
Q109 : COMMON-BASE AMP
Q110,111 : BUFFER
Q168 : SUB CORRECTION
Q107 : DYNAMIC ABL
IC102 : SHARPNESS
VR106 : SUB-SHARPNESS ADJ
Q122 : BUFFER
Q123,124 : VIDEO MUTING
Q112 : BUFFER
IC103 : VIDEO DEMODULATION
VR104 : PRE-BRIGHT ADJ
Q125,126 : BURST KILLER
Q127 – 129 : BUFFER
Q141,142 : R MATRIX
Q149,150 : G MATRIX
Q157,158 : B MATRIX
Q144 : PEDESTAL CLAMP
Q143,145 : BUFFER
Q151,153 : BUFFER
Q152 : PEDESTAL CLAMP
Q159 : BUFFER
Q160 : PEDESTAL CLAMP
Q161 : BUFFER
Q162 : BLANKING GENERATOR & COMPARATOR
Q146 : BLANKING GENERATOR & COMPARATOR
Q147 : R INVERTER AMP
Q155 : G INVERTER AMP
Q163 : B INVERTER AMP
Q154 : BLANKING GENERATOR & COMPARATOR
VR107 : BLUE TAILING ADJ
VR108 : R.CUT OFF ADJ
VR110 : G.CUTOFF ADJ
VR111 : B.CUTOFF ADJ
VR109 : R DRIVE ADJ
VR112 : B.DRIVE ADJ
Q148 : R TELOP COMPOSITION
Q156 : G TELOP COMPOSITION
Q164 : B TELOP COMPOSITION
Q132 – 135,167 : PEAK ACL
Q136 : DC TRANSMISSION RATIO CORRECTION
Q137 – 140 : BLANKING WAVE SHAPER
FUNC
ABL 2
SHARP
COLOR
TINT
V. MUTE
BRIGHT
TELOP B
TELOP G
TELOP R
CONVERGENCE ASSEMBLY (➡P28) G7
SUB BRIGHT
SUB TINT
SUB COLOR
TSW
TS G
GND
+13.5V
A5
VIDEO, TUNER ASSEMBLY (1/5) J102 (➡P18)
N.C
+13.5V
GND
(➡P32) DEFLECTION ASSEMBLY E2
R.CRT ASSEMBLY (AWZ1945)
G.CRT ASSEMBLY (AWZ1946)
B.CRT ASSEMBLY (AWZ1947)
CRT ASSEMBLY R (AWY1039)
CRT ASSEMBLY G (AWY1038)
CRT ASSEMBLY B(AWY1040)
ANODE
HT+
HT−
+240V
SCREEN
FOCUS
R.K
G.K
B.K
GND
M1
M2
M3
N1
N2
N3
P1
P2
A1
1 R
2 GND
3 +13.5V
4 G
5 GND
6 13.5V
7 B
8 GND
9 +13.5V
Q801 2SC2278
D801 1SS252
Q801 : R DRIVE
L801,802 : LAU470K
L803 : LAU101K
C923 : ACH-378
C924 : ACG1001
R752 : ACN1006
R755 : ACN-225
Q821 2SC2278
D821 1SS252
Q821 : G DRIVE
L821,822 : LAU470K
L823 : LAU101K
C933 : ACH-378
C934 : ACG1001
R762 : ACN1006
R765 : ACN-225
Q841 2SC2278
D841 1SS252
Q841 : B DRIVE
L841,842 : LAU470K
L843 : LAU101K
C943 : ACH-378
C944 : ACG1001
R772 : ACN1006
R775 : ACN-225
(➡P33) DEFLECTION ASSEMBLY
ANODE
GND
FOCUS
VR1 FOCUS VARIABLE RESISTOR ACX1014
B FOCUS ADJ
G FOCUS ADJ
R FOCUS ADJ
B SCREEN ADJ
G SCREEN ADJ
R SCREEN ADJ
DEFLECTION ASSEMBLY E4 (➡P33)
DF
TP05
TP13
TP06
TP07
TP41
TP42
TP46 R
TP46 B
TP47R
TP 47G
TP 47B

5.5 CONTROL SECTION

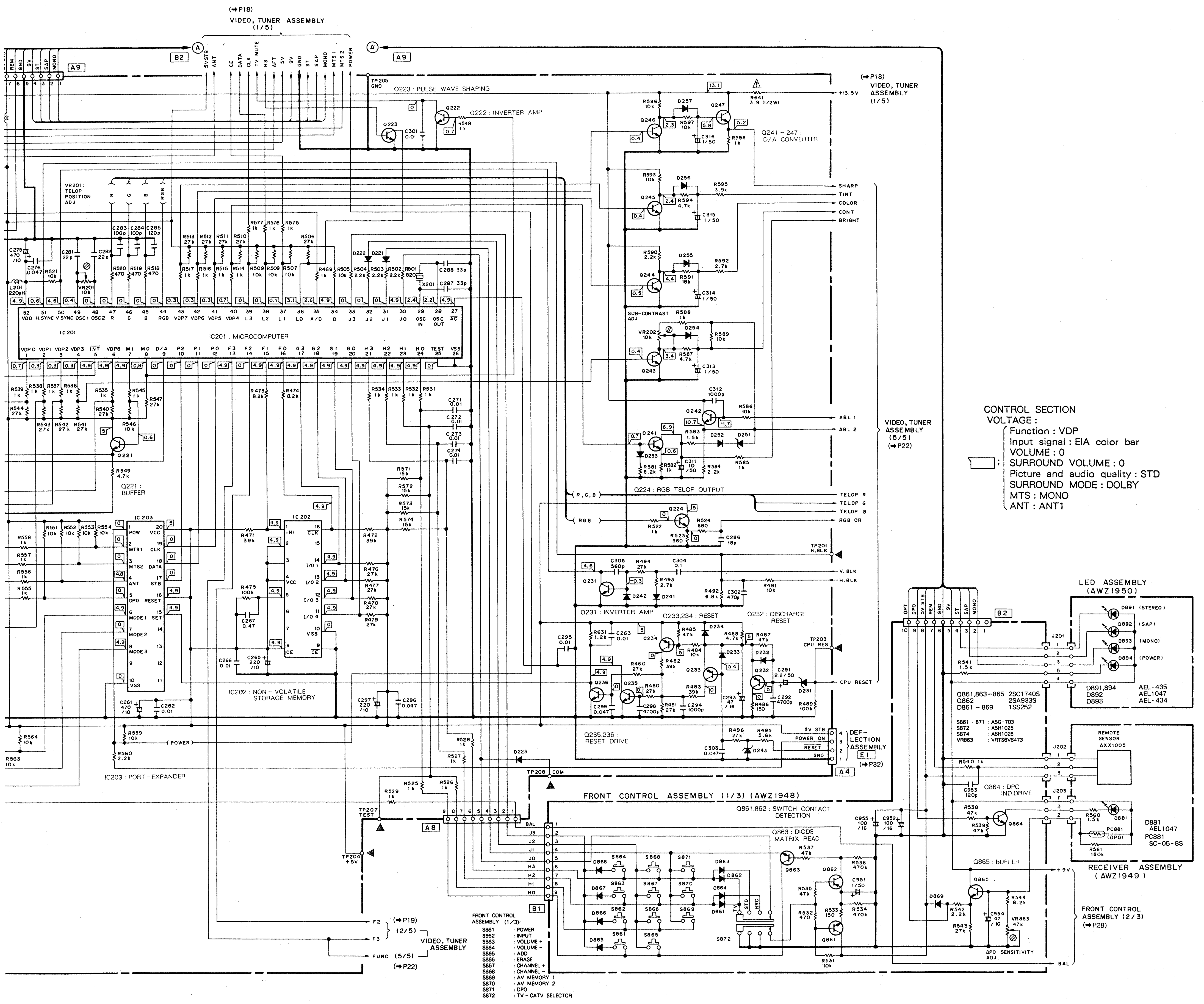

1
2
3
4
5
6
A
B
C
D
(➔P18)
VIDEO, TUNER ASSEMBLY (1/5)
VIDEO, TUNER ASSEMBLY (4/5) (AWV1027)
A9
B2
A
5V STB
ANT
CE
DATA
CLK
TV MUTE
TS
AFT
5V
9V
GND
ST
SAP
MONO
MTS 1
MTS 2
POWER
OPT
DPO
REM
TP205 GND
Q223 : PULSE WAVE SHAPING
Q222 : INVERTER AMP
+13.5V
VIDEO, TUNER ASSEMBLY (1/5)
Q241 - 247 : D/A CONVERTER
SHARP
TINT
COLOR
CONT
BRIGHT
ABL 1
ABL 2
VIDEO, TUNER ASSEMBLY (2/5) REMOTE CONTROL OUTPUT (➔P19)
Q203 : REMOTE CONTROL OUTPUT
Q201, 202 : BUFFER
VR201 : TELOP POSITION ADJ
R G B RGB
IC201 : MICROCOMPUTER
SUB-CONTRAST ADJ
TP209 AFT (A/D)
Q211 - 213 : AFT, DPO SWITCH
Q221 : BUFFER
Q224 : RGB TELOP OUTPUT
(R, G, B)
(RGB)
TELOP R
TELOP G
TELOP B
RGB OR
TP201 H.BLK
V. BLK
H.BLK
Q251 - 258 : D/A CONVERTER
A10
VOLUME
BALANCE
TREBLE
BASS
V. MUTE
SUR. VOL2
SUR. VOL1
IC203
IC202
Q231 : INVERTER AMP
Q233, 234 : RESET
Q232 : DISCHARGE RESET
TP203 CPU RES
CPU RESET
SURROUND ASSEMBLY W3 (➔P20)
IC202 : NON - VOLATILE STORAGE MEMORY
A11
5V STB
STADIUM
DOLBY
S.S.
(POWER)
IC203 : PORT - EXPANDER
Q235, 236 : RESET DRIVE
DEF-LECTION ASSEMBLY E1 (➔P32)
5V STB
POWER ON
RESET
GND
A4
TP208 COM
FRONT CONTROL ASSEMBLY (1/3) (AWZ1948)
Q861, 862 : SWITCH CONTACT DETECTION
Q863 : DIODE MATRIX READ
TP207 TEST
TP204 +5V
A8
B1
(➔P22)
(5/5) V. MUTE
VIDEO, TUNER ASSEMBLY (➔P19)
(2/5) V. MUTE
F2 (➔P19)
(2/5)
F3
VIDEO, TUNER ASSEMBLY
FUNC (5/5) (➔P22)
STD
HRC
VIDEO, ASSEM (5/5) (➔P2

IC201 PD5084-A
IC202 CXK1005P
IC203 CXD1067P
Q201 - 203,211 - 213,221 - 224,
Q231,235,236,241 - 247,
Q251 - 258 2SC1740S
Q232 - 234 2SA933S
D201,202,211,221 - 223,
D232 - 234,241,242,252 - 257,
D261 - 265 1SS252
D231 RD4.3ESB
D243 HZS6B1L
D251 RD3.0ESB

L201,202 : LAU221K
VR201 : VRTS6VS103
VR202 : ACP1025
X201 : ASS-030

FRONT CONTROL
ASSEMBLY (1/3)

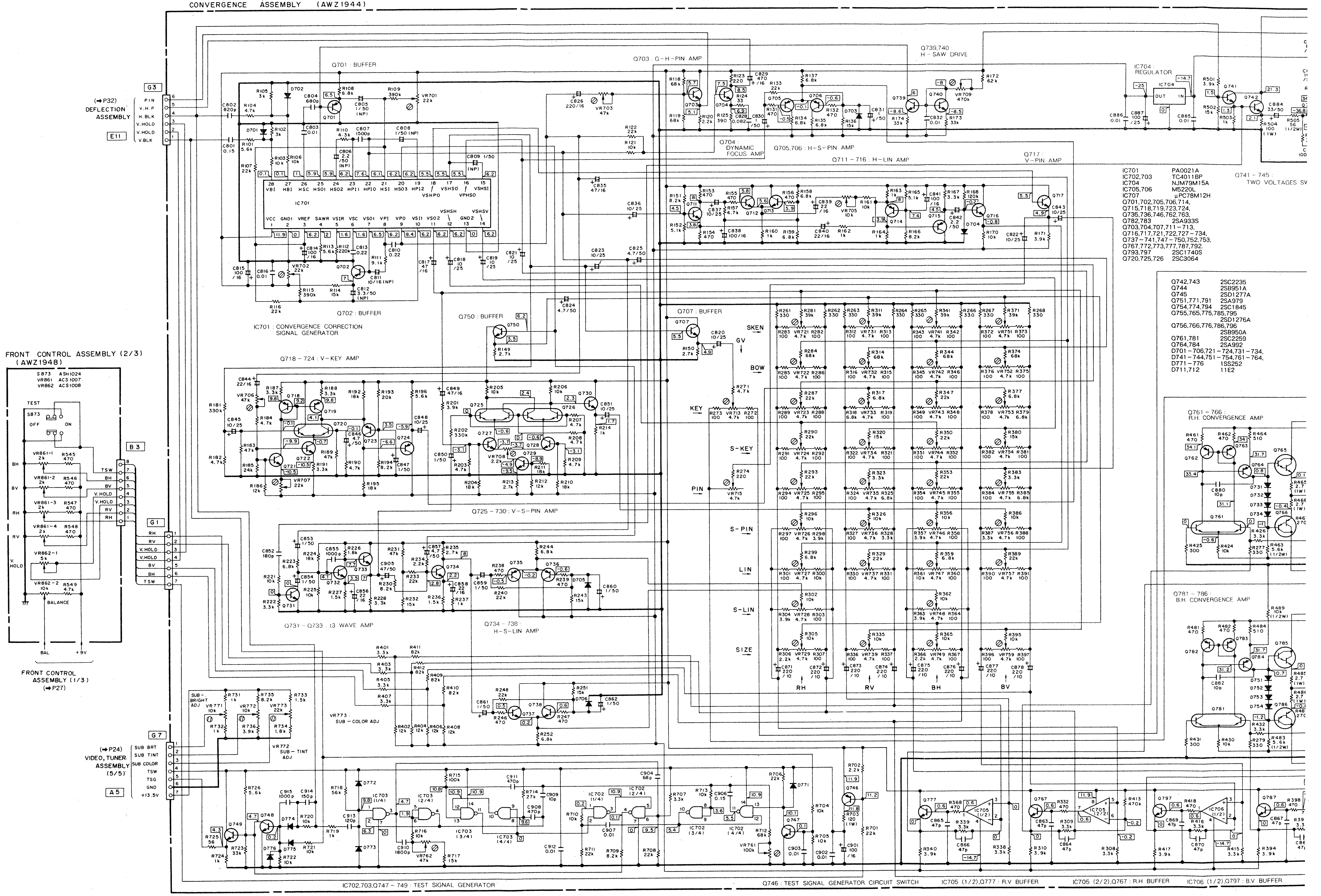
S861 : POWER
S862 : INPUT
S863 : VOLUME +
S864 : VOLUME -
S865 : ADD
S866 : ERASE
S867 : CHANNEL +
S868 : CHANNEL -
S869 : AV MEMORY 1
S870 : AV MEMORY 2
S871 : DPO
S872 : TV - CATV SELECTOR


(→P18)
VIDEO, TUNER ASSEMBLY (1/5)
IC201 : MICROCOMPUTER
IC202 : NON-VOLATILE STORAGE MEMORY
IC203 : PORT-EXPANDER
Q221 : BUFFER
Q222 : INVERTER AMP
Q223 : PULSE WAVE SHAPING
Q224 : RGB TELOP OUTPUT
Q231 : INVERTER AMP
Q232 : DISCHARGE RESET
Q233,234 : RESET
Q235,236 : RESET DRIVE
Q241 - 247 D/A CONVERTER
VR201 : TELOP POSITION ADJ
VR202 : SUB-CONTRAST ADJ
SHARP
TINT
COLOR
CONT
BRIGHT
ABL 1
ABL 2
TELOP R
TELOP G
TELOP B
RGB OR
H.BLK
V.BLK
CPU RESET
VIDEO, TUNER ASSEMBLY (5/5) (→P22)
DEFLECTION ASSEMBLY E1 (→P32)
5V STB
POWER ON
RESET
GND
FRONT CONTROL ASSEMBLY (1/3) (AWZ1948)
Q861,862 : SWITCH CONTACT DETECTION
Q863 : DIODE MATRIX READ
Q864 : DPO IND.DRIVE
Q865 : BUFFER
DPO SENSITIVITY ADJ
F2 (→P19) (2/5)
F3
FUNC (5/5) (→P22)
VIDEO, TUNER ASSEMBLY
FRONT CONTROL ASSEMBLY (2/3) (→P28)
LED ASSEMBLY (AWZ1950)
D891 (STEREO)
D892 (SAP)
D893 (MONO)
D894 (POWER)
D891,894 AEL-435
D892 AEL1047
D893 AEL-434
Q861,863-865 2SC1740S
Q862 2SA933S
D861 - 869 1SS252
S861 - 871 : ASG-703
S872 : ASH1025
S874 : ASH1026
VR863 : VRTS6VS473
REMOTE SENSOR AXX1005
RECEIVER ASSEMBLY (AWZ1949)
D881 AEL1047
PC881 SC-05-8S
FRONT CONTROL ASSEMBLY (1/3)
S861 : POWER
S862 : INPUT
S863 : VOLUME +
S864 : VOLUME −
S865 : ADD
S866 : ERASE
S867 : CHANNEL +
S868 : CHANNEL −
S869 : AV MEMORY 1
S870 : AV MEMORY 2
S871 : DPO
S872 : TV − CATV SELECTOR
4
5
6
7
8
9
A
B
C
D

CONTROL SECTION
VOLTAGE :

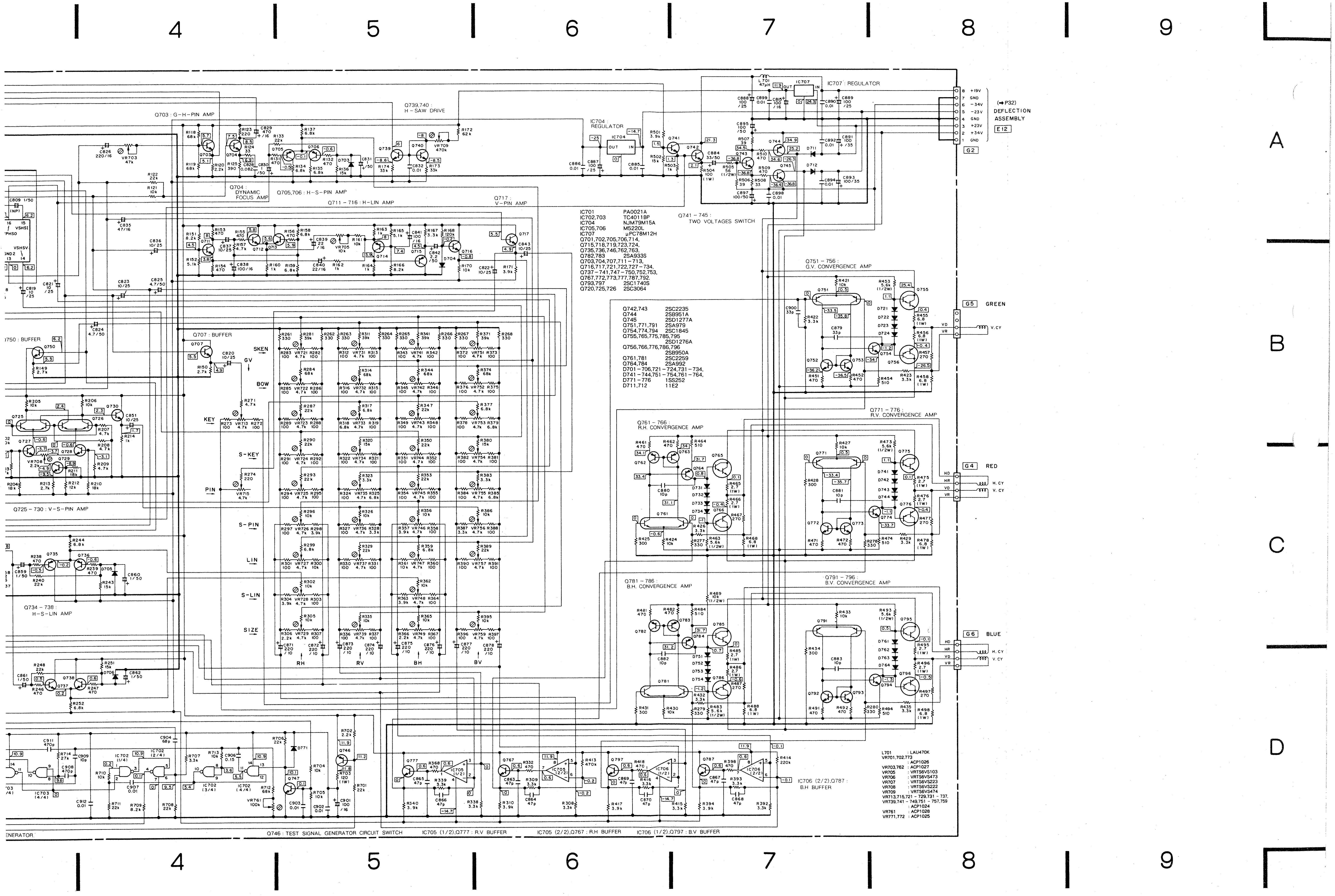
▭ ; Function : VDP
Input signal : EIA color bar
VOLUME : 0
SURROUND VOLUME : 0
Picture and audio quality : STD
SURROUND MODE : DOLBY
MTS : MONO
ANT : ANT1

5.6 CONVERGENCE SECTION

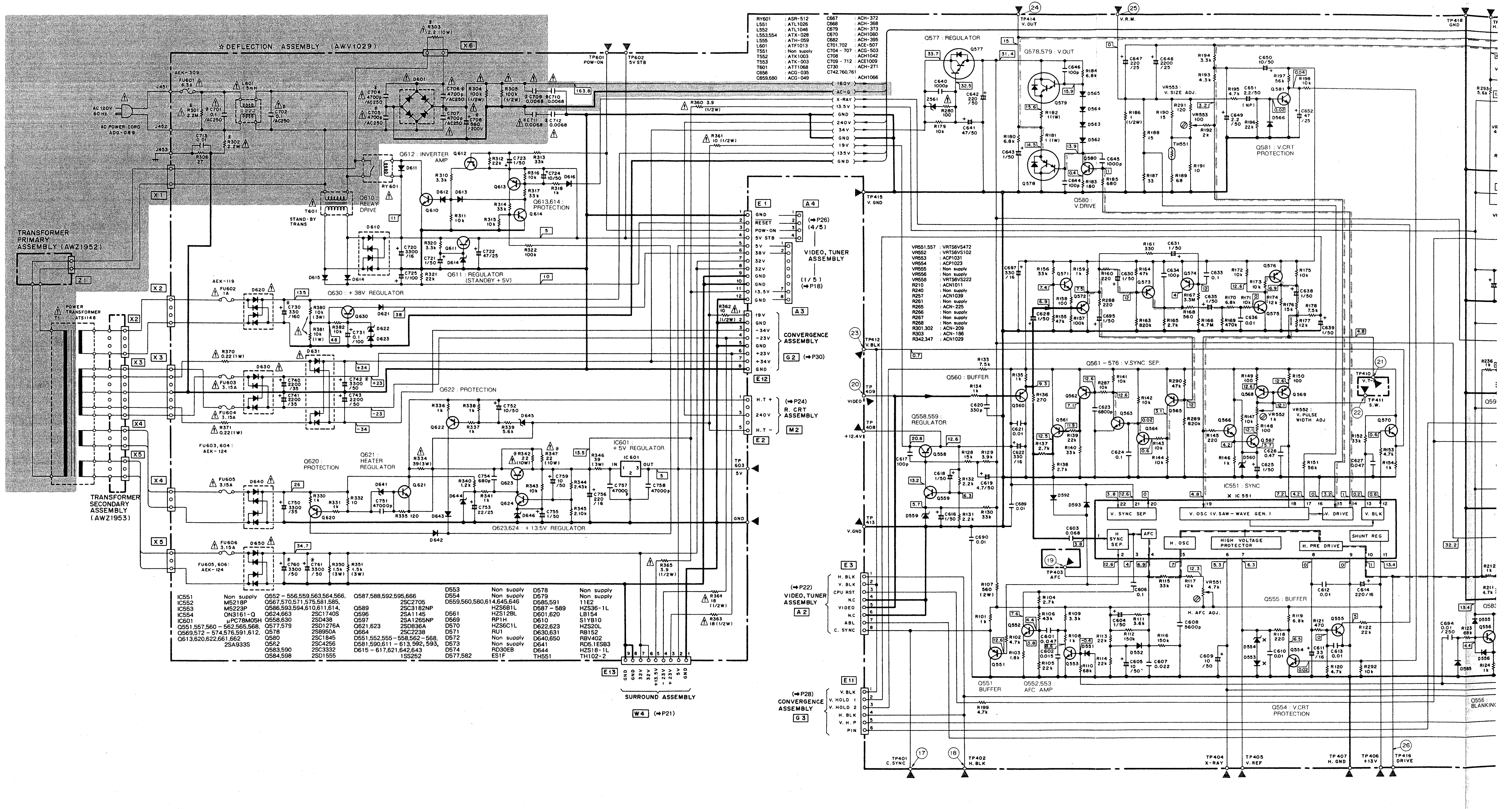

1
2
3
4
5
6
A
B
C
D
CONVERGENCE ASSEMBLY (AWZ1944)
(➡P32) DEFLECTION ASSEMBLY
G3
E11
PIN
V.H.P
H.BLK
V.HOLD
V.HOLD
V.BLK
Q701 : BUFFER
Q702 : BUFFER
IC701 : CONVERGENCE CORRECTION SIGNAL GENERATOR
Q703 : G-H-PIN AMP
Q704 DYNAMIC FOCUS AMP
Q705,706 : H-S-PIN AMP
Q739,740 H-SAW DRIVE
IC704 REGULATOR
Q711 - 716 : H-LIN AMP
Q717 : V-PIN AMP
Q741 - 745 : TWO VOLTAGES SV
Q707 : BUFFER
Q750 : BUFFER
Q718 - 724 : V-KEY AMP
Q725 - 730 : V-S-PIN AMP
Q731 - Q733 : t3 WAVE AMP
Q734 - 738 H-S-LIN AMP
SKEN
BOW
KEY
S-KEY
PIN
S-PIN
LIN
S-LIN
SIZE
RH
RV
BH
BV
FRONT CONTROL ASSEMBLY (2/3) (AWZ1948)
S873 ASH1024
VR861 ACS1007
VR862 ACS1008
TEST
OFF
ON
BALANCE
B3
G1
BAL
+9V
FRONT CONTROL ASSEMBLY (1/3) (➡P27)
VR773 : SUB-COLOR ADJ
SUB-BRIGHT ADJ
VR772 SUB-TINT ADJ
(➡P24) VIDEO, TUNER ASSEMBLY (5/5)
G7
A5
SUB BRT
SUB TINT
SUB COLOR
TSW
TSG
GND
+13.5V
Q761 - 766 : R.H. CONVERGENCE AMP
Q781 - 786 : B.H. CONVERGENCE AMP
IC702,703,Q747 - 749 : TEST SIGNAL GENERATOR
Q746 : TEST SIGNAL GENERATOR CIRCUIT SWITCH
IC705 (1/2),Q777 : R.V BUFFER
IC705 (2/2),Q767 : R.H BUFFER
IC706 (1/2),Q797 : B.V BUFFER

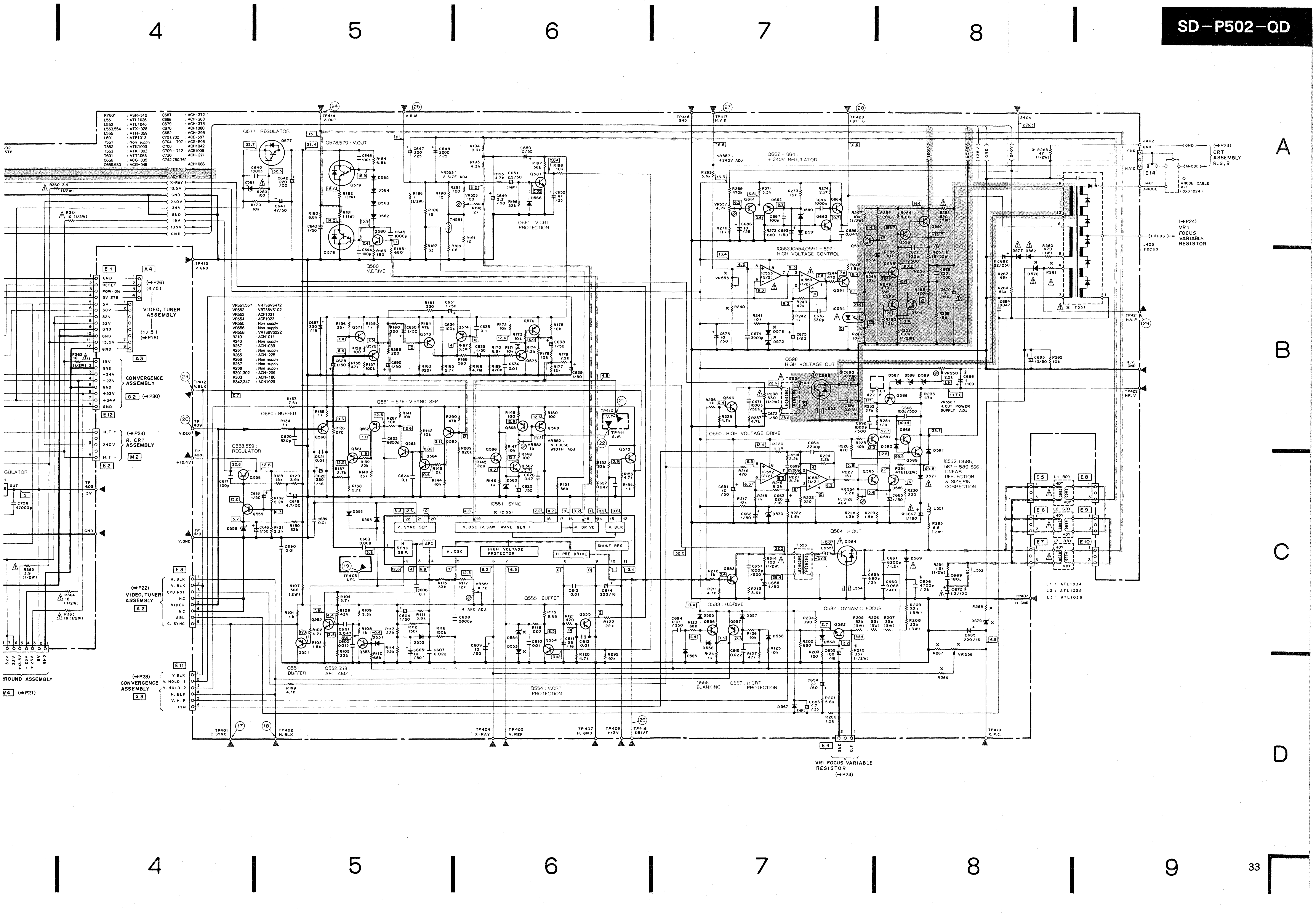
IC701	PA0021A
IC702,703	TC4011BP
IC704	NJM79M15A
IC705,706	M5220L
IC707	µPC78M12H
Q701,702,705,706,714, Q715,718,719,723,724, Q735,736,746,762,763, Q782,783	2SA933S
Q703,704,707,711-713, Q716,717,721,722,727-734, Q737-741,747-750,752,753, Q767,772,773,777,787,792, Q793,797	2SC1740S
Q720,725,726	2SC3064

Q742,743	2SC2235
Q744	2SB951A
Q745	2SD1277A
Q751,771,791	2SA979
Q754,774,794	2SC1845
Q755,765,775,785,795	2SD1276A
Q756,766,776,786,796	2SB950A
Q761,781	2SC2259
Q764,784	2SA992
D701-706,721-724,731-734, D741-744,751-754,761-764, D771-776	1SS252
D711,712	11E2


4
5
6
7
8
9
A
B
C
D
Q703 : G-H-PIN AMP
Q739,740 : H-SAW DRIVE
IC704 : REGULATOR
IC707 : REGULATOR
Q704 : DYNAMIC FOCUS AMP
Q705,706 : H-S-PIN AMP
Q711 - 716 : H-LIN AMP
Q717 : V-PIN AMP
Q741 - 745 : TWO VOLTAGES SWITCH
(➡P32) DEFLECTION ASSEMBLY
E12
G2
+19V
GND
-34V
-23V
GND
+23V
+34V
GND
IC701 PA0021A
IC702,703 TC4011BP
IC704 NJM79M15A
IC705,706 M5220L
IC707 µPC78M12H
Q701,702,705,706,714,
Q715,718,719,723,724,
Q735,736,746,762,763,
Q782,783 2SA933S
Q703,704,707,711-713,
Q716,717,721,722,727-734,
Q737-741,747-750,752,753,
Q767,772,773,777,787,792,
Q793,797 2SC1740S
Q720,725,726 2SC3064
Q742,743 2SC2235
Q744 2SB951A
Q745 2SD1277A
Q751,771,791 2SA979
Q754,774,794 2SC1845
Q755,765,775,785,795 2SD1276A
Q756,766,776,786,796 2SB950A
Q761,781 2SC2259
Q764,784 2SA992
D701-706,721-724,731-734,
D741-744,751-754,761-764,
D771-776 1SS252
D711,712 11E2
Q751 - 756 : G.V. CONVERGENCE AMP
G5 GREEN
V.CY
Q771 - 776 : R.V. CONVERGENCE AMP
Q761 - 766 : R.H. CONVERGENCE AMP
G4 RED
H.CY
V.CY
Q781 - 786 : B.H. CONVERGENCE AMP
Q791 - 796 : B.V. CONVERGENCE AMP
G6 BLUE
H.CY
V.CY
Q707 : BUFFER
Q750 : BUFFER
SKEN
BOW
KEY
S-KEY
PIN
S-PIN
LIN
S-LIN
SIZE
GV
RH
RV
BH
BV
Q725 - 730 : V-S-PIN AMP
Q734 - 739 : H-S-LIN AMP
L701 : LAU470K
VR701,702,773 : ACP1026
VR703,762 : ACP1027
VR705 : VRTS6VS103
VR706 : VRTS6VS473
VR707 : VRTS6VS223
VR708 : VRTS6VS222
VR709 : VRTS6VS474
VR713,715,721 - 729,731 - 737,
VR739,741 - 749,751 - 757,759 : ACP1024
VR761 : ACP1028
VR771,772 : ACP1025
IC706 (2/2),Q787 : B.H BUFFER
ENERATOR
Q746 : TEST SIGNAL GENERATOR CIRCUIT SWITCH
IC705 (1/2),Q777 : R.V BUFFER
IC705 (2/2),Q767 : R.H BUFFER
IC706 (1/2),Q797 : B.V BUFFER

5.7 DEFLECTION AND POWER SUPPLY SECTION


☆DEFLECTION ASSEMBLY (AWV1029)
AC 120V 60Hz
AC POWER CORD ADG-089
TRANSFORMER PRIMARY ASSEMBLY (AWZ1952)
POWER TRANSFORMER ATS1148
TRANSFORMER SECONDARY ASSEMBLY (AWZ1953)
Q612 : INVERTER AMP
Q610 : RELAY DRIVE
RY601
T601 STAND-BY TRANS
Q613,614 : PROTECTION
Q611 : REGULATOR (STANDBY + 5V)
Q630 : + 38V REGULATOR
Q622 : PROTECTION
Q620 PROTECTION
Q621 HEATER REGULATOR
IC601 : + 5V REGULATOR
Q623,624 : + 13.5V REGULATOR
TP601 POW-ON
TP602 5V STB
VIDEO, TUNER ASSEMBLY
R. CRT ASSEMBLY
CONVERGENCE ASSEMBLY
SURROUND ASSEMBLY
Q577 : REGULATOR
Q578,579 : V.OUT
Q580 : V.DRIVE
Q581 : V.CRT PROTECTION
VR553 : V. SIZE ADJ.
Q560 : BUFFER
Q558,559 : REGULATOR
Q561 - 576 : V.SYNC SEP.
VR552 : V. PULSE WIDTH ADJ
IC551 : SYNC
V. SYNC SEP
V. OSC (V. SAW-WAVE GEN.)
V. DRIVE
V. BLK
H SYNC SEP.
AFC
H. OSC
HIGH VOLTAGE PROTECTOR
H. PRE DRIVE
SHUNT REG
VR551 : H. AFC ADJ.
Q551 BUFFER
Q552,553 AFC AMP
Q555 : BUFFER
Q554 : V.CRT PROTECTION
Q556 : BLANKING
TP401 C. SYNC
TP402 H. BLK
TP403 AFC
TP404 X-RAY
TP405 V. REF
TP406 +13V
TP407 H. GND
TP408
TP409
TP410 V.T
TP411 S.W.
TP412 V.BLK
TP413 V.GND
TP414 V. OUT
TP415 V. GND
TP416 DRIVE
TP418 GND
1
2
3
4
5
6
A
B
C
D



RY601	: ASR-512	C667	: ACH-372
L551	: ATL1026	C668	: ACH-368
L552	: ATL1046	C679	: ACH-373
L553,554	: ATX-028	C670	: ACH1080
L555	: ATH-059	C682	: ACH-395
L601	: ATF1013	C701,702	: ACE-507
T551	: Non supply	C704 - 707	: ACG-503
T552	: ATK1003	C708	: ACH1042
T553	: ATK-003	C709 - 712	: ACE1009
T601	: ATT1068	C730	: ACH-271
C656	: ACG-035	C742,760,761	: ACH1066
C659,680	: ACG-049		

VR551,557	: VRTS6VS472
VR552	: VRTS6VS102
VR553	: ACP1031
VR554	: ACP1023
VR555	: Non supply
VR556	: Non supply
VR558	: VRTS6VS222
R210	: ACN1011
R240	: Non supply
R257	: ACN1039
R261	: Non supply
R265	: ACN-225
R266	: Non supply
R267	: Non supply
R268	: Non supply
R301,302	: ACN-209
R303	: ACN-186
R342,347	: ACN1029

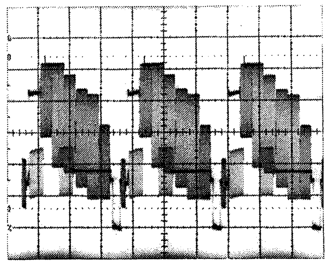
4
5
6
7
8
9
A
B
C
D
160V
AC-G
X-RAY
13.5V
GND
240V
34V
GND
19V
135V
GND
Q577 : REGULATOR
Q578,579 : V.OUT
Q580 : V.DRIVE
Q581 : V.CRT PROTECTION
VR553 : V. SIZE ADJ.
TP414 V. OUT
V.R.M.
TP418 GND
TP417 H.V.D
TP420 FBT-6
240V
Q662 - 664 + 240V REGULATOR
VR557 : +240V ADJ
IC553,IC554,Q591 - 597 HIGH VOLTAGE CONTROL
J402 GND
(→P24) CRT ASSEMBLY R,G,B
H.V.D
E14
(ANODE)
J401 ANODE
ANODE CABLE KIT (GXX1024)
(→P24) VR1 FOCUS VARIABLE RESISTOR
J403 FOCUS
T551
TP421 H.V.P
TP415 V. GND
E1
A4
(→P26) (4/5)
VIDEO, TUNER ASSEMBLY
(1/5) (→P18)
GND
RESET
POW-ON
5V ST8
5V
38V
32V
32V
GND
GND
13.5V
GND
A3
19V
GND
-34V
-23V
GND
+23V
+34V
GND
CONVERGENCE ASSEMBLY
G2 (→P30)
E12
H.T +
240V
H.T -
(→P24) R. CRT ASSEMBLY
M2
E2
Q561 - 576 : V.SYNC SEP
Q560 : BUFFER
Q558,559 : REGULATOR
TP412 V.BLK
TP409 VIDEO
TP408 +12.4V
TP413 V.GND
TP603 5V
TP410 V.T
TP411 S.W.
VR552 : V. PULSE WIDTH ADJ
Q570
Q598 : HIGH VOLTAGE OUT
T552
Q590 : HIGH VOLTAGE DRIVE
TP422 H.R
VR558 : H.OUT POWER SUPPLY ADJ
TP422 HR. V
H.V. GND
IC552, Q585, 587 - 589, 666 LINEAR DEFLECTION & SIZE,PIN CORRECTION
VR554 : H. SIZE ADJ
IC551 : SYNC
V. SYNC SEP
V. OSC (V. SAW-WAVE GEN.)
V. DRIVE
V. BLK
H SYNC SEP.
AFC
H. OSC
HIGH VOLTAGE PROTECTOR
H. PRE DRIVE
SHUNT REG
TP403 AFC
E3
(→P22) VIDEO, TUNER ASSEMBLY
A2
H. BLK
V. BLK
CPU RST
N.C
VIDEO
N.C
ABL
C. SYNC
VR551 : H. AFC ADJ.
Q555 : BUFFER
Q551 BUFFER
Q552,553 AFC AMP
Q554 : V.CRT PROTECTION
Q584 : H.OUT
T553
L555
Q583 : H.DRIVE
Q582 : DYNAMIC FOCUS
Q556 BLANKING
Q557 : H.CRT PROTECTION
E5
E8
E6
E9
E7
E10
L1 RDY
L2 GDY
L3 BDY
HDY
VDY
L1 : ATL1034
L2 : ATL1035
L3 : ATL1036
TP407 H.GND
VR556
E11
(→P28) CONVERGENCE ASSEMBLY
G3
V.BLK
V. HOLD 1
V. HOLD 2
H. BLK
V. H.P
PIN
TP401 C.SYNC
TP402 H.BLK
TP404 X-RAY
TP405 V. REF
TP407 H. GND
TP406 +13V
TP416 DRIVE
TP419 X.P.C.
E4
VR1 FOCUS VARIABLE RESISTOR (→P24)
GULATOR
ROUND ASSEMBLY
W4 (→P21)

The waveforms at each position

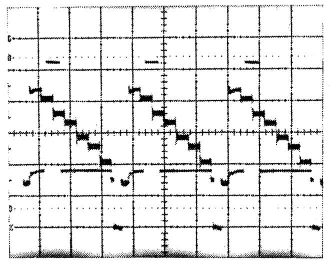
Input signal ; ①–⑯ : color bar VDP terminal input
⑰–㉙ : monoscope
Picture quality : standard
Range : AC range (without notice)

Note : H GND : TP407
V GND : TP413
H・V GND : without TP number.

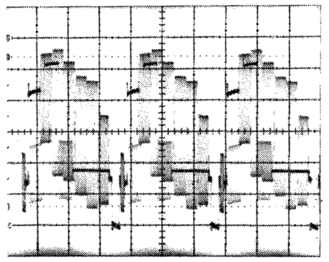
① **TP12 (Video selector output)**
V : 0.2V/div, H : 10μsec/div
pedestal level : 5.1V



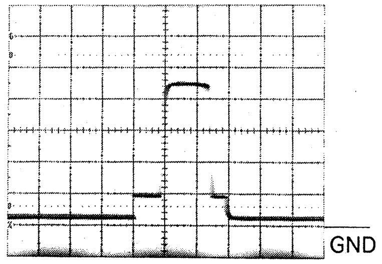
② **TP01 (Comb filter Y output)**
V : 0.2V/div, H : 20μsec/div
Pedestal level : 4.0V



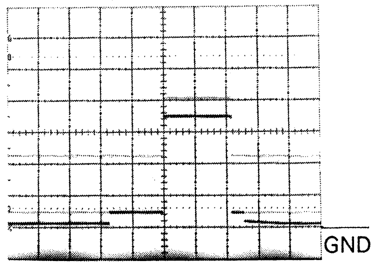
③ **TP02 (Comb filter C output)**
V : 0.2V/div, H : 20μsec/div
Pedestal level : 4.0V



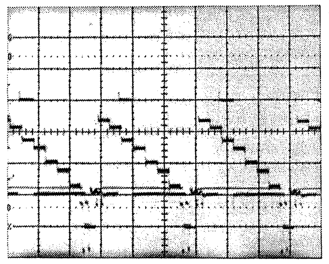
④ **TP03 (Blanking input)**
V : 1V/div, H : 5μsec/div
H rate DC range



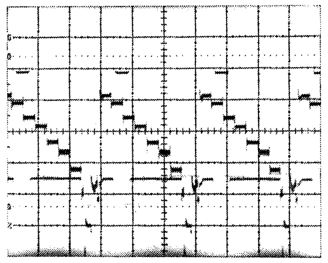
④ **TP03 (Blanking input)**
V : 2V/div, H : 0.5msec/div
V rate DC range



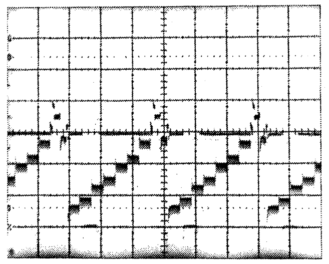
⑤ **TP04 (Dynamic black expander output)**
V : 0.5V/div, H : 20μsec/div
Pedestal level : 8.4V



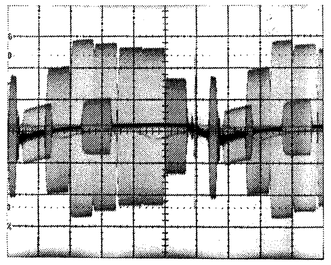
⑥ **TP05 (Dynamic outline control output)**
V : 0.1V/div, H : 20μsec/div
Pedestal level : 3.3V



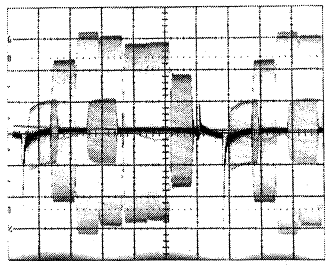
⑦ **TP13 (Contrast control output)**
V : 0.5V/div, H : 20μsec/div
Pedestal level : 5.4V



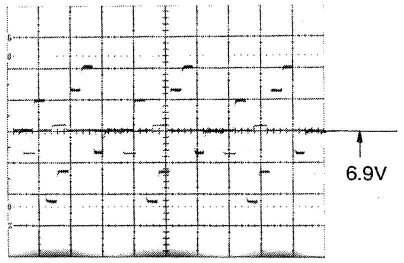
⑧ **TP41 (Color, tint control input)**
V : 0.05V/div, H : 10μsec/div
Color burst level : 190mVp-p



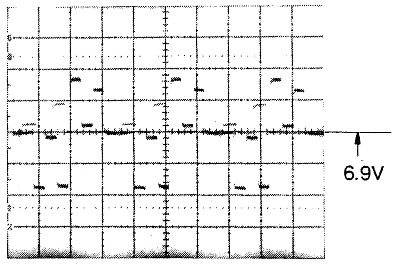
⑨ **TP42 (Color control output)**
V : 0.1V/div, H : 10μsec/div



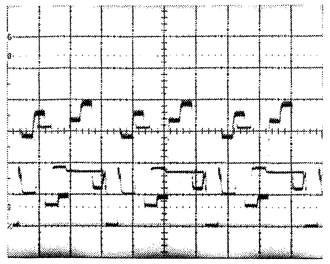
⑩ **TP46R (Color demo, output R)**
V : 1V/div, H : 20μsec/div
DC range



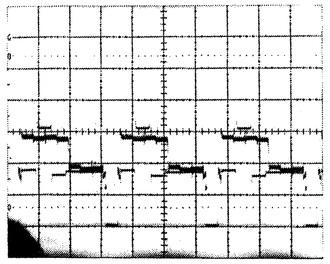
⑪ **TP46B (Color demo, output B)**
V : 1V/div, H : 20μsec/div
DC range



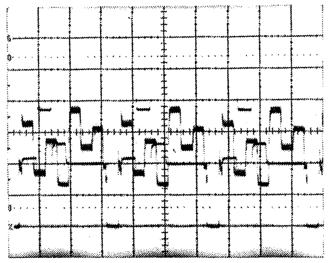
⑫ **TP47R (Matrix output R)**
V : 1V/div, H : 20μsec/div
Pedestal level : 3.5V



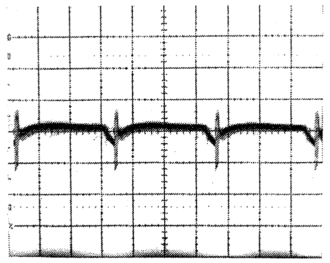
⑬ **TP47G (Matrix output G)**
V : 1V/div, H : 20μsec/div
Pedestal level : 3.5V



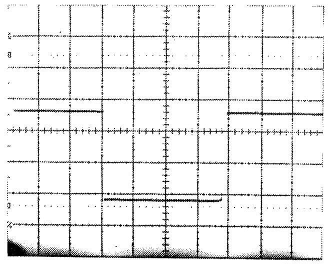
⑭ **TP47B (Matrix output B)**
V : 1V/div, H : 20μsec/div
Pedestal level : 3.5V



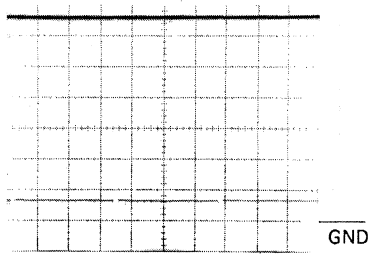
⑮ **TP06 (APC error output)**
V : 0.05V/div, H : 20μsec/div



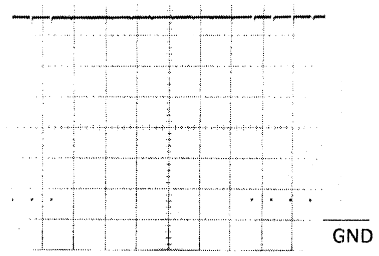
⑯ **TP07 (Video blanking)**
V : 2V/div, H : 2μsec/div
H rate DC range



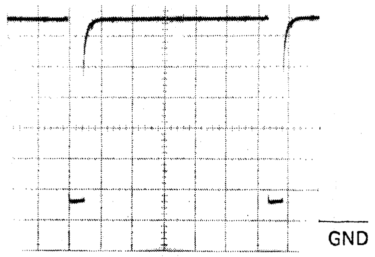
⑰ **TP401 (C. SYNC)** for H GND
V : 2V/div, **H : 5msec/div**
DC range



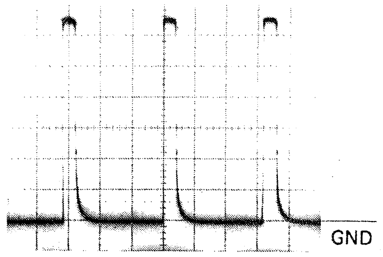
V : 2V/div, **H : 100μsec/div**
DC range



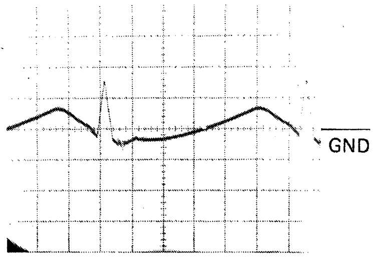
V : 2V/div, **H : 10μsec/div**
DC range



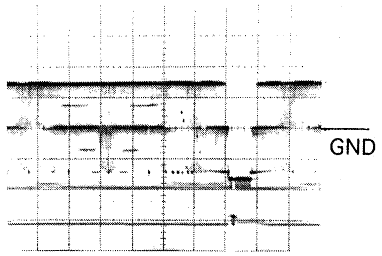
⑱ **TP402 (H. BLK)** for H GND
V : 2V/div, H : 20msec/div
DC range



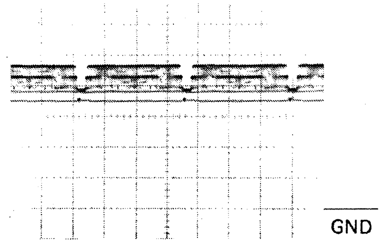
⑲ **TP403 (AFC)** for H GND
V : 50mV/div, H : 10μsec/div



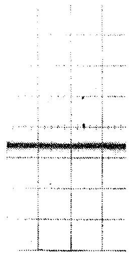
⑳ **TP409 (Video)** for H GND
V : 500mV/div, **H : 2msec/div**



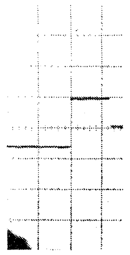
V : 2V/div, **H : 5msec/div**
DC range



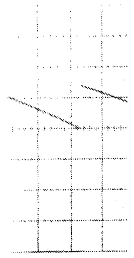
㉑ **TP410 (V.**
V : 2V/div,
DC range



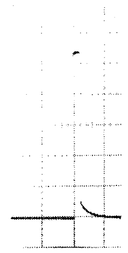
V : 2V/div,
DC range



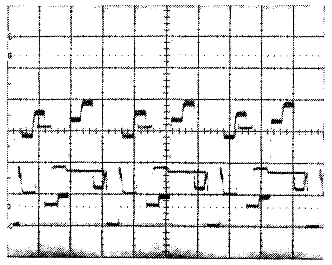
㉒ **TP411 (S.**
V : 2V/div,
DC range



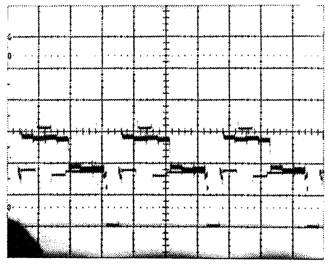
㉓ **TP412 (V.**
V : 2V/div,
DC range



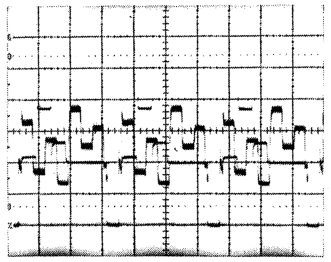
⑫ TP47R (Matrix output R)
V : 1V/div, H : 20µsec/div
Pedestal level : 3.5V



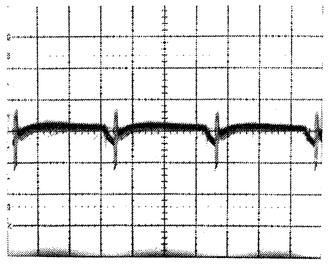
⑬ TP47G (Matrix output G)
V : 1V/div, H : 20µsec/div
Pedestal level : 3.5V



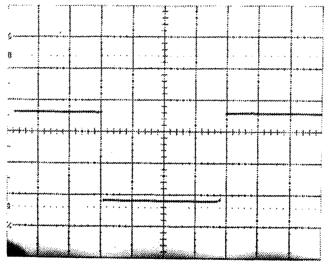
⑭ TP47B (Matrix output B)
V : 1V/div, H : 20µsec/div
Pedestal level : 3.5V



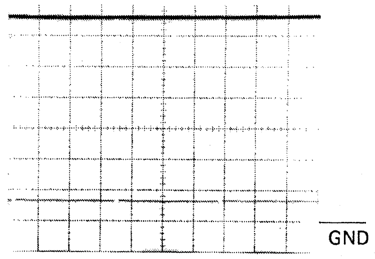
⑮ TP06 (APC error output)
V : 0.05V/div, H : 20µsec/div



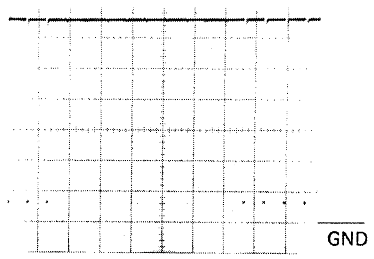
⑯ TP07 (Video blanking)
V : 2V/div, H : 2µsec/div
H rate DC range



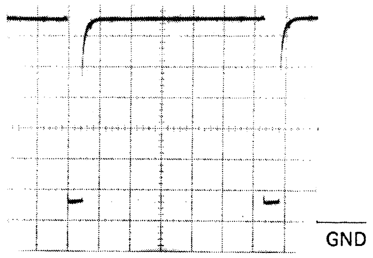
⑰ TP401 (C. SYNC) for H GND
V : 2V/div, **H : 5msec/div**
DC range



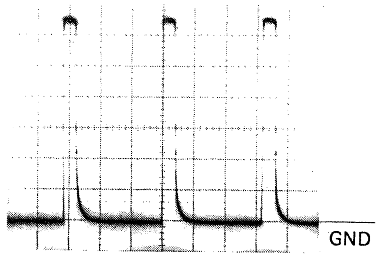
V : 2V/div, **H : 100µsec/div**
DC range



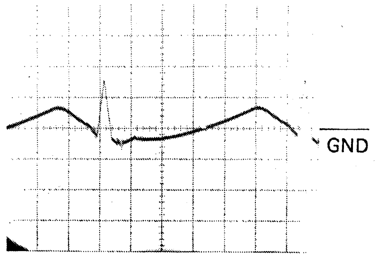
V : 2V/div, **H : 10µsec/div**
DC range



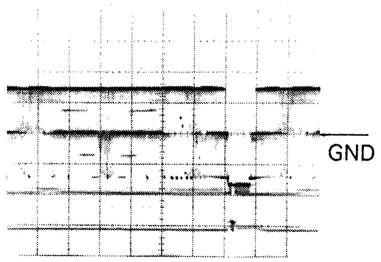
⑱ TP402 (H. BLK) for H GND
V : 2V/div, H : 20msec/div
DC range



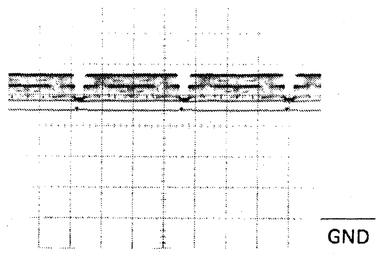
⑲ TP403 (AFC) for H GND
V : 50mV/div, H : 10µsec/div



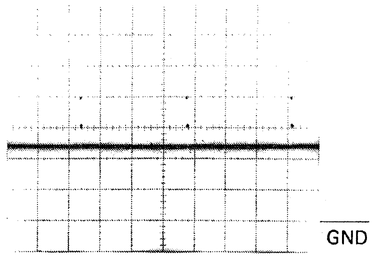
⑳ TP409 (Video) for H GND
V : 500mV/div, **H : 2msec/div**



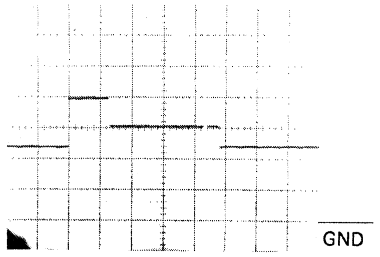
V : 2V/div, **H : 5msec/div**
DC range



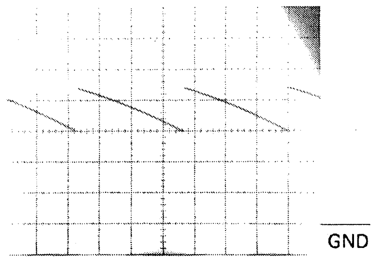
㉑ TP410 (V. T) for H GND
V : 2V/div, **H : 5msec/div**
DC range



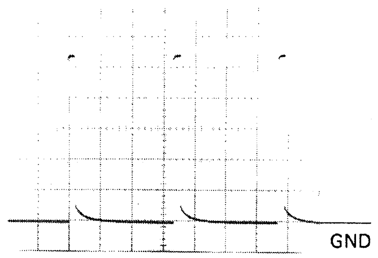
V : 2V/div, **H : 50µsec/div**
DC range



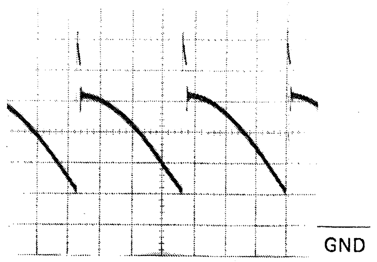
㉒ TP411 (S. W) for V GND
V : 2V/div, H : 5msec/div
DC range



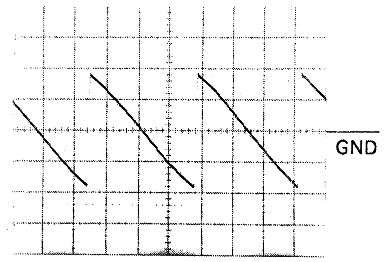
㉓ TP412 (V. BLK) for V GND
V : 2V/div, H : 5msec/div
DC range



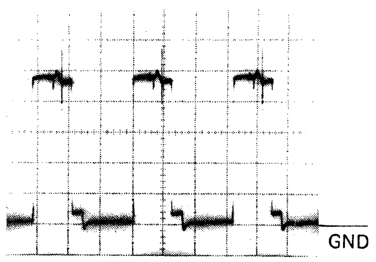
㉔ TP414 (V. OUT) for V GND
V : 5V/div, H : 5msec/div
DC range



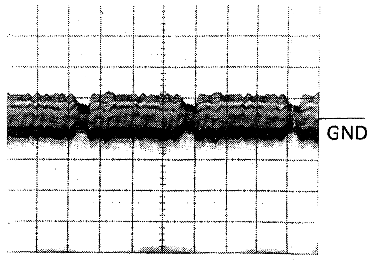
㉕ V. R. M for V GND
V : 1V/div, H : 5msec/div
DC range



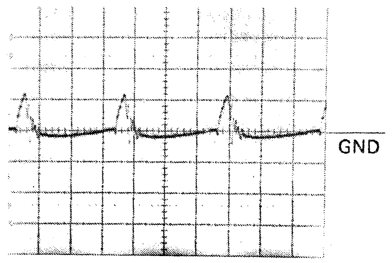
㉖ TP416 (Drive) for H GND
V : 500mV/div, H : 20µsec/div
DC range



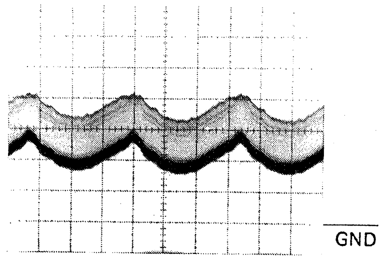
㉗ TP417 (H. V. D) for H GND
V : 50mV/div, **H : 5msec/div**



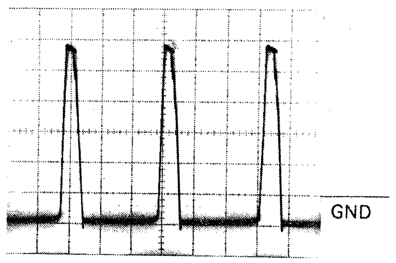
㉗ TP417 (H. V. D) for H GND
V : 50mV/div, **H : 20µsec/div**

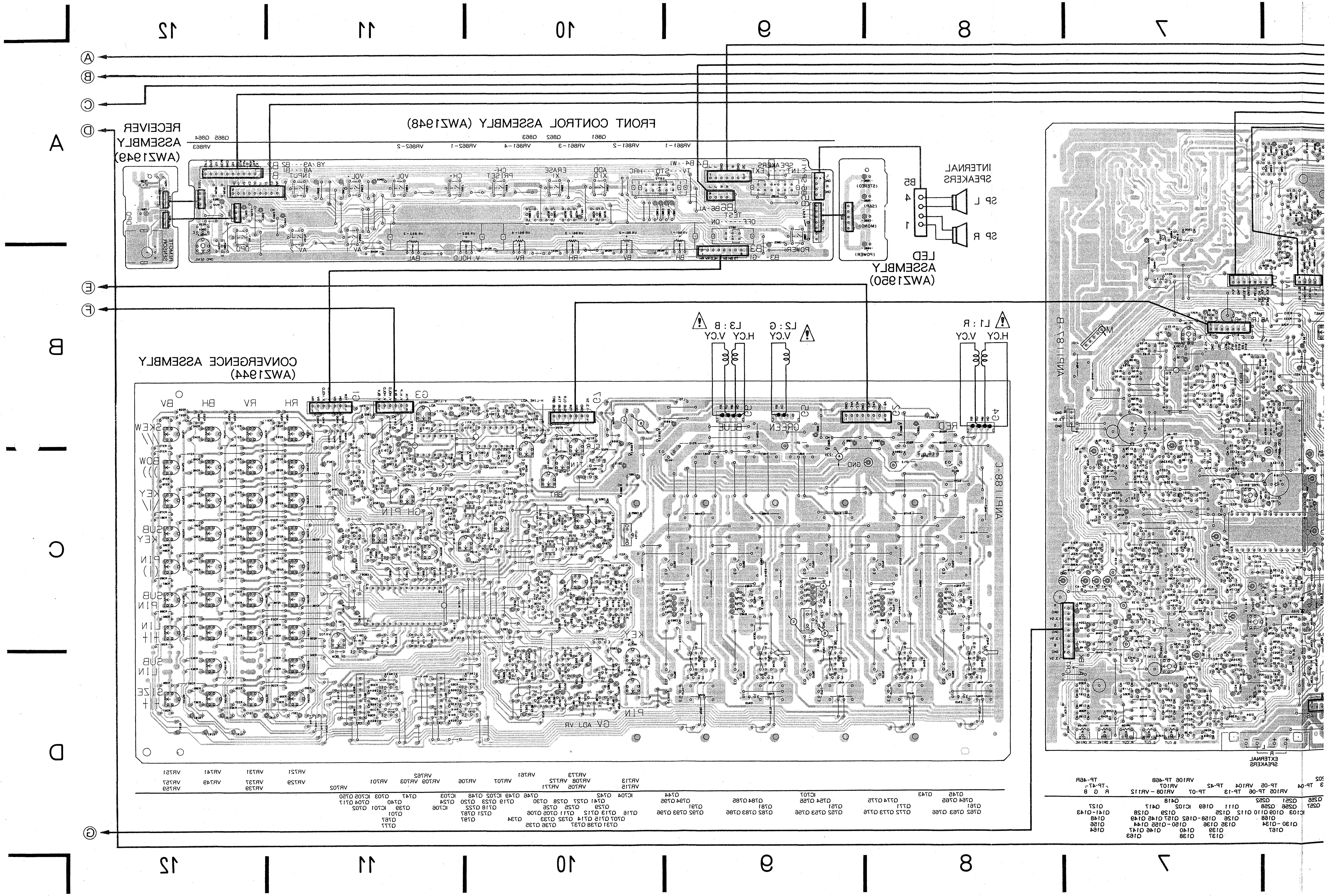


㉘ TP420 (FBT－6) for H・V GND
V : 2V/div, H : 5msec/div
DC range

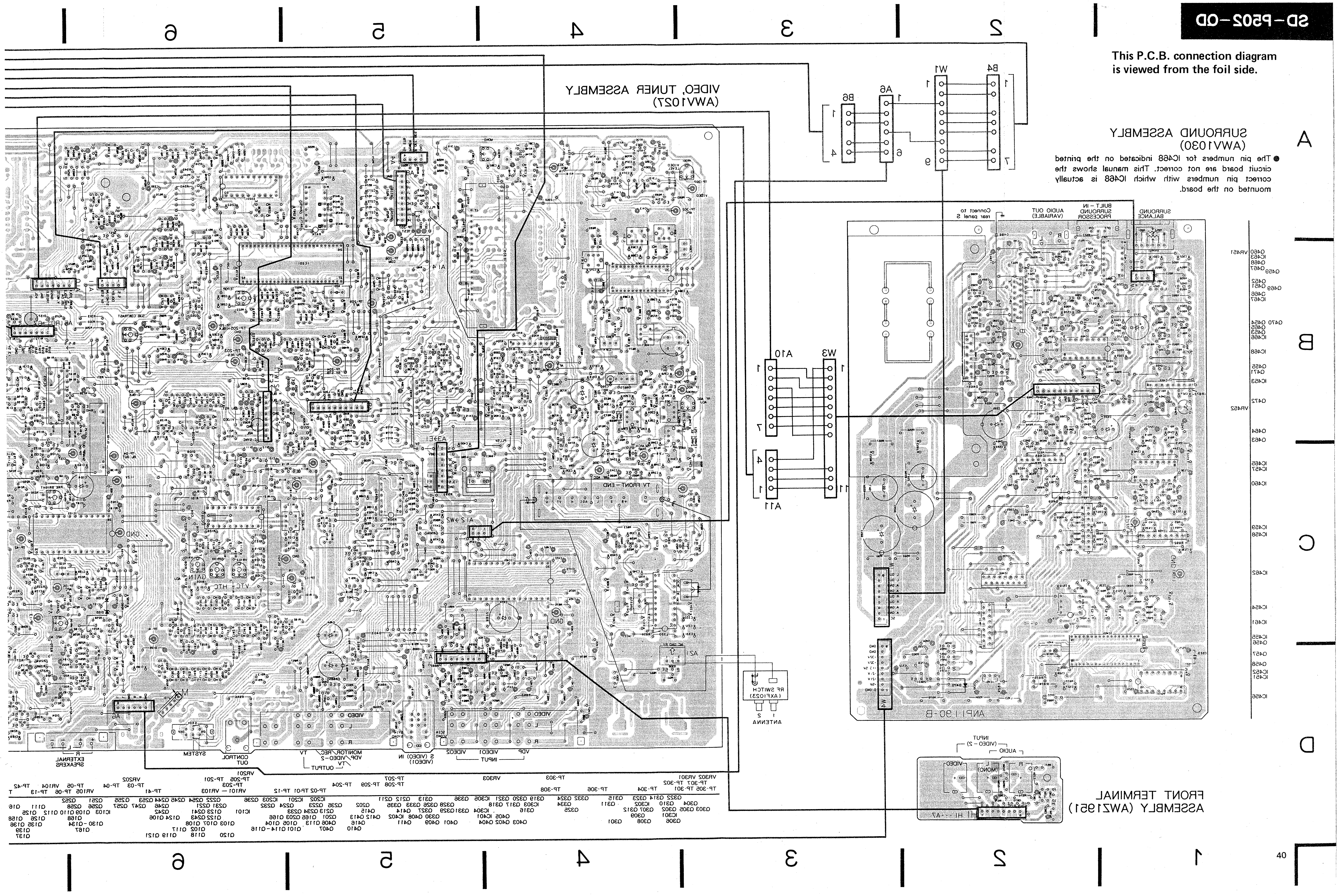


㉙ TP421 (H. V. P) for H・V GND
V : 5V/div, H : 20µsec/div
DC range



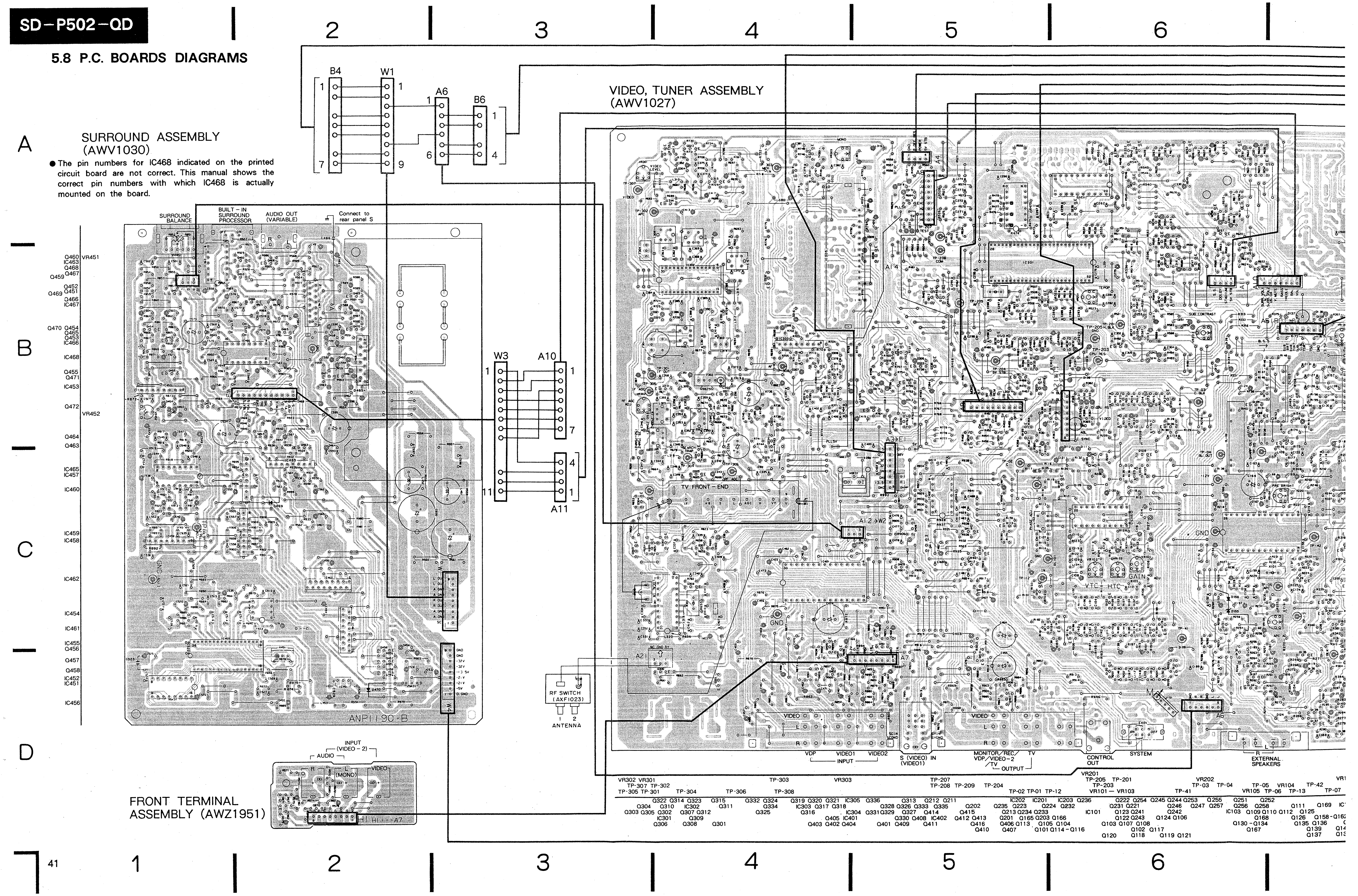

12
11
10
9
8
7
A
B
C
D
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Ⓕ
Ⓖ
RECEIVER ASSEMBLY (AWZ1949)
FRONT CONTROL ASSEMBLY (AWZ1948)
LED ASSEMBLY (AWZ1950)
INTERNAL SPEAKERS
B5
SP L
SP R
TEST
ON
OFF
POWER
CONVERGENCE ASSEMBLY (AWZ1944)
L1 : R
L2 : G
L3 : B
H.CY
V.CY
RED
GREEN
BLUE
GND
G1
G3
RH
RV
BH
BV
SKEW
BOW
KEY
SUB KEY
PIN
SUB PIN
LIN
SUB LIN
SIZE
CV ADJ VR
ANP1188-C
ANP1187-B
EXTERNAL SPEAKERS

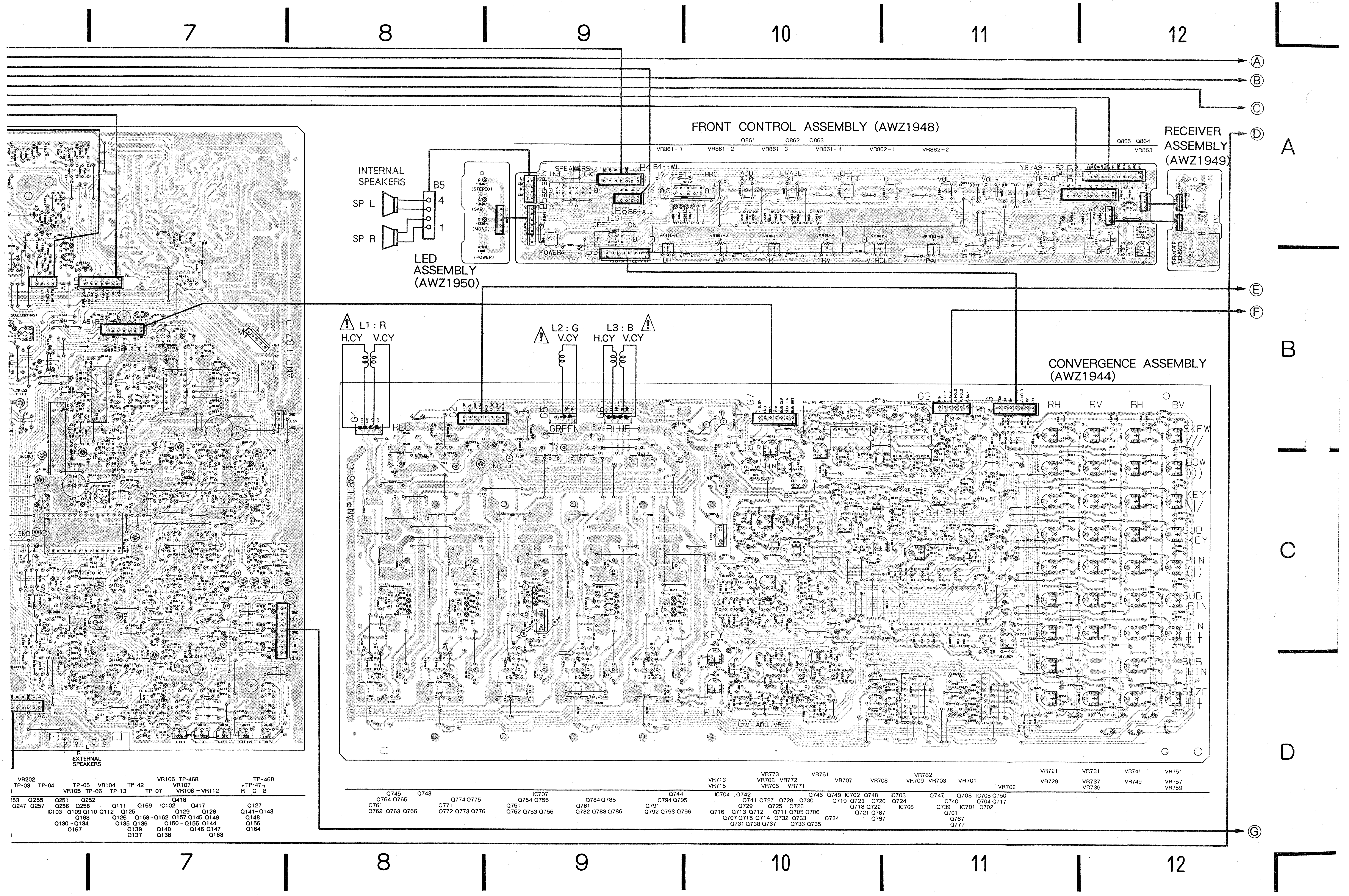
This P.C.B. connection diagram is viewed from the foil side.

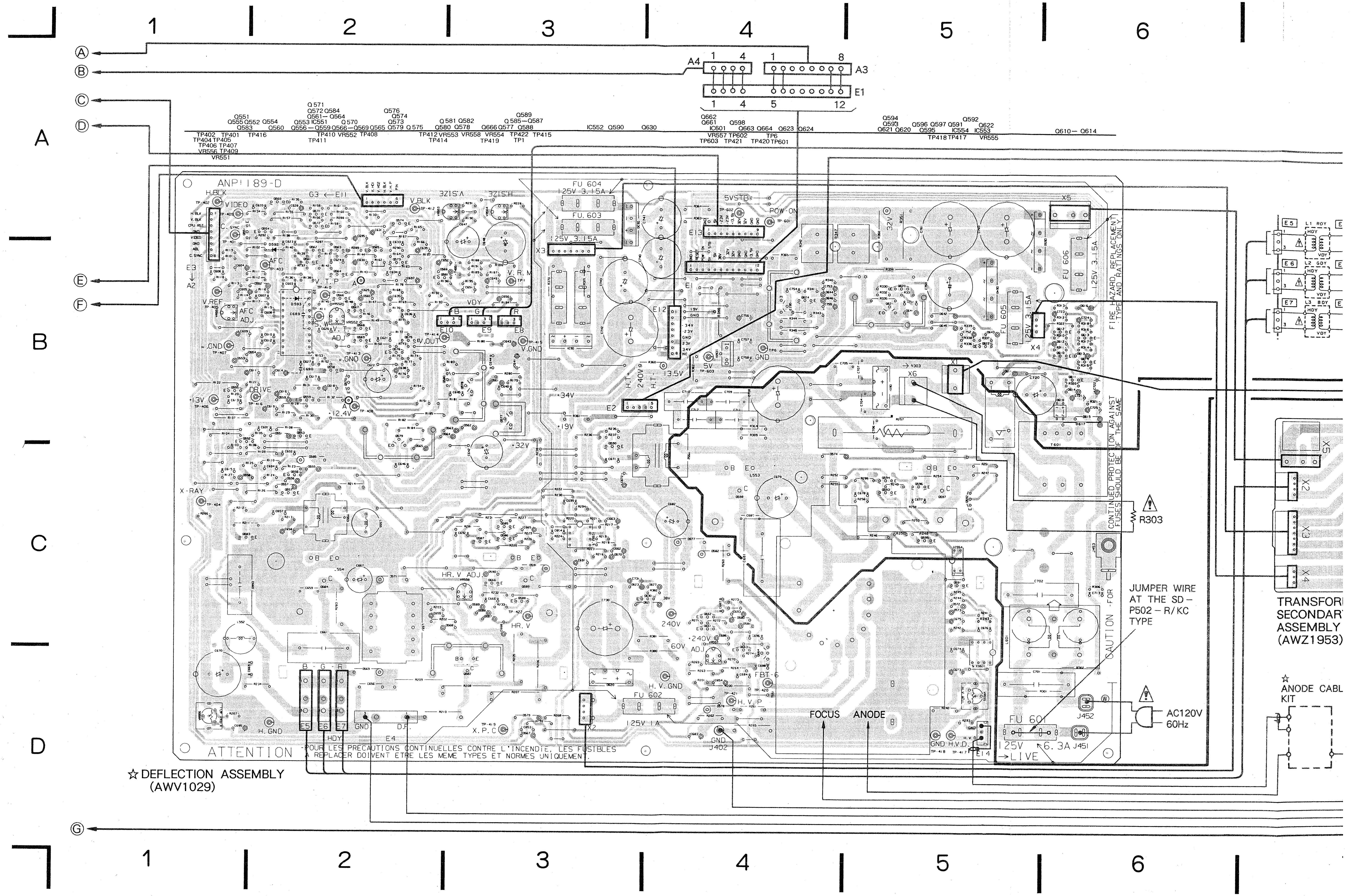

VIDEO, TUNER ASSEMBLY (AWV1027)
SURROUND ASSEMBLY (AWV1030)
● The pin numbers for IC468 indicated on the printed circuit board are not correct. This manual shows the correct pin numbers with which IC468 is actually mounted on the board.
FRONT TERMINAL ASSEMBLY (AWZ1951)
RF SWITCH (AXF1023)
ANTENNA
TV FRONT-END
W1
B4
A6
B6
A10
W3
A11
ANP1190-B
SURROUND BALANCE
BUILT-IN SURROUND PROCESSOR
AUDIO OUT (VARIABLE)
Connect to rear panel S
INPUT (VIDEO-2) AUDIO
EXTERNAL SPEAKERS
SYSTEM
CONTROL OUT
MONITOR/REC OUTPUT
S (VIDEO) IN
VIDEO1 VIDEO2 INPUT
VDP
6
5
4
3
2
1
A
B
C
D

5.8 P.C. BOARDS DIAGRAMS

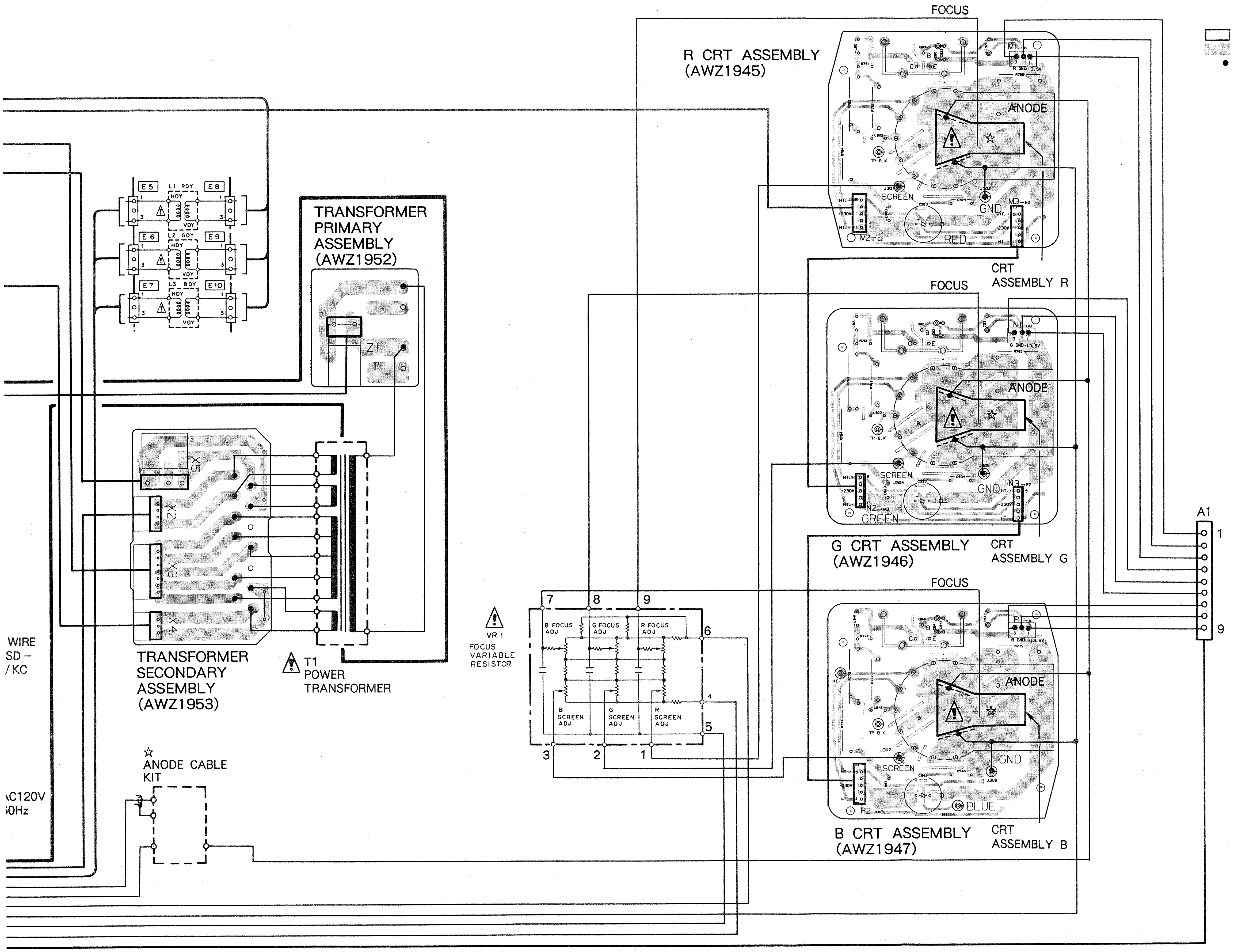
- The pin numbers for IC468 indicated on the printed circuit board are not correct. This manual shows the correct pin numbers with which IC468 is actually mounted on the board.


2
3
4
5
6
A
B
C
D
1
2
3
4
5
6
B4
W1
A6
B6
1
7
1
9
1
6
1
4
VIDEO, TUNER ASSEMBLY
(AWV1027)
SURROUND ASSEMBLY
(AWV1030)
SURROUND BALANCE
BUILT - IN SURROUND PROCESSOR
AUDIO OUT (VARIABLE)
Connect to rear panel S
Q460 VR451
IC463
Q468
Q459 Q467
Q452
Q469 Q451
Q466
IC467
Q470 Q454
Q465
Q453
IC466
IC468
Q455
Q471
IC453
Q472
VR452
Q464
Q463
IC465
IC457
IC460
IC459
IC458
IC462
IC454
IC461
IC455
Q456
Q457
Q458
IC452
IC451
IC456
ANP1190-B
W3
A10
1
7
11
4
1
A11
W4
RF SWITCH
(AXF1023)
1 2
ANTENNA
TV FRONT - END
GND
VTC
HTC
GAIN
A1 4
A8
A2 1 W1
A3 E1
A1 2 W2
A21
A7
A5
IC201
VIDEO
L
R
VDP
VIDEO1
VIDEO2
INPUT
S (VIDEO) IN
(VIDEO1)
MONITOR/REC/
VDP/VIDEO-2
/TV
TV
OUTPUT
CONTROL OUT
SYSTEM
ON
OFF
EXTERNAL SPEAKERS
FRONT TERMINAL ASSEMBLY (AWZ1951)
INPUT
(VIDEO - 2)
AUDIO
VIDEO
(MONO)
H1 - A7
VR302 VR301
TP-307 TP-302
TP-305 TP-301
TP-304
TP-306
TP-303
TP-308
VR303
TP-207
TP-208 TP-209
TP-204
TP-02 TP-01 TP-12
VR201
TP-205 TP-201
TP-203
VR101 — VR103
TP-41
VR202
TP-03 TP-04
TP-05 VR104
VR105 TP-06
TP-13
TP-42
TP-07
Q322 Q314 Q323
Q304 Q310 IC302
Q303 Q305 Q302
IC301
Q306
Q307 Q312
Q309
Q308
Q315
Q311
Q301
Q332 Q324
Q334
Q325
Q319 Q320 Q321
IC303 Q317 Q318
Q316
IC305
IC304
Q405 IC401
Q403 Q402 Q404
Q336
Q331 Q329
Q401
Q313
Q328 Q326 Q333
Q327
Q330 Q408
Q409
Q212 Q211
Q335
Q414
IC402
Q411
Q202
Q415
Q412 Q413
Q416
Q410
Q235 Q223
Q213 Q234 Q233
Q201 Q165 Q203 Q166
Q406 Q113
Q407
IC202 IC201
Q224 Q232
Q105 Q104
Q101 Q114 - Q116
IC203 Q236
IC101
Q222 Q254
Q231 Q221
Q123 Q241
Q122 Q243
Q103 Q107 Q108
Q102 Q117
Q120 Q118
Q119 Q121
Q245 Q244 Q253
Q246
Q242
Q124 Q106
Q247
Q255
Q257
Q251
Q256
IC103
Q109 Q110 Q112
Q168
Q130 - Q134
Q167
Q252
Q258
Q111
Q125
Q126
Q135 Q136
Q139
Q137
Q169
Q158 - Q16


7
8
9
10
11
12
A
B
C
D
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Ⓕ
Ⓖ
FRONT CONTROL ASSEMBLY (AWZ1948)
RECEIVER ASSEMBLY (AWZ1949)
Q861 Q862 Q863 Q865 Q864
VR861-1 VR861-2 VR861-3 VR861-4 VR862-1 VR862-2 VR863
INTERNAL SPEAKERS
SP L
SP R
B5
4
1
LED ASSEMBLY (AWZ1950)
(STEREO)
(SAP)
(MONO)
(POWER)
SPEAKERS INT - - EXT
B4
B6
TEST OFF - - ON
TV - - STD - - HRC
ADD X/O
ERASE XI
CH PRISET
CH-
VOL-
VOL
INPUT
B2
B1
B3
POWER
BH
BV
RH
RV
V. HOLD
BAL
AV 1
AV 2
DPO
REMOTE SENSOR
L1 : R
H.CY
V.CY
L2 : G
V.CY
L3 : B
H.CY
V.CY
CONVERGENCE ASSEMBLY (AWZ1944)
G4
G2
G5
G6
G7
G3
G1
RED
GREEN
BLUE
GND
ANP1188-C
ANP1187-B
CLR
TINT
BRT
GH PIN
KEY
PIN
GV ADJ VR
RH
RV
BH
BV
SKEW
BOW
KEY
SUB KEY
PIN
SUB PIN
LIN
SUB LIN
SIZE
A1
A5
A6
EXTERNAL SPEAKERS
R
L
B. CUT
G. CUT
R. CUT
B. DRIVE
R. DRIVE
CRT
GND
13.5V
VR202
TP-03
TP-04
TP-05
VR104
VR105
TP-06
TP-42
TP-13
VR106 TP-46B
VR107
TP-07
VR108 - VR112
TP-46R
TP-47
R G B
253 Q255 Q251 Q252
Q247 Q257 Q256 Q258
IC103 Q109 Q110 Q112
Q168
Q130 - Q134
Q167
Q111 Q169 IC102 Q418 Q417
Q125 Q129 Q128
Q126 Q158 - Q162 Q157 Q145 Q149
Q135 Q136 Q150 - Q155 Q144
Q139 Q140 Q146 Q147
Q137 Q138 Q163
Q127
Q141 - Q143
Q148
Q156
Q164
Q745 Q743
Q764 Q765
Q761
Q762 Q763 Q766
Q774 Q775
Q771
Q772 Q773 Q776
IC707
Q754 Q755
Q751
Q752 Q753 Q756
Q784 Q785
Q781
Q782 Q783 Q786
Q744
Q794 Q795
Q791
Q792 Q793 Q796
VR713
VR715
VR773
VR708 VR772
VR705 VR771
VR761
VR707
VR706
VR762
VR709 VR703
VR701
VR702
VR721
VR729
VR731
VR737
VR739
VR741
VR749
VR751
VR757
VR759
IC704 Q742
Q741 Q727 Q728 Q730
Q729 Q725 Q726
Q716 Q713 Q712 Q711 Q705 Q706
Q707 Q715 Q714 Q732 Q733
Q731 Q738 Q737 Q736 Q735
Q734
Q746 Q749 IC702 Q748
Q719 Q723 Q720
Q718 Q722
Q721 Q787
Q797
IC703
Q724
IC706
Q747
Q740
Q739
Q701
Q767
Q777
Q703 IC705 Q750
Q704 Q717
IC701 Q702


1
2
3
4
5
6
A
B
C
D
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Ⓕ
Ⓖ
A4
A3
E1
ANP1189-D
H.BLK
VIDEO
AFC
V.REF
AFC ADJ
V.BLK
V.SIZE
H.SIZE
V.R.M
VDY
V.OUT
V.GND
DRIVE
X-RAY
FU 604 125V 3.15A
FU 603 125V 3.15A
FU 605 125V 3.15A
FU 606 125V 3.15A
FU 602 125V 1A
FU 601 125V 6.3A
5VSTB
POW-ON
E12
E13
E2
E3
E4
E5
E6
E7
E8
E9
E10
X1
X2
X3
X4
X5
X6
+34V
+19V
+32V
13.5V
240V
60V
240V ADJ
HR.V ADJ
HR.V
H.V.GND
H.V.P
FBT-6
X.P.C
H.GND
HDY
GND
D.F.
FOCUS
ANODE
GND H.V.D.
LIVE
J402
J451
J452
AC120V 60Hz
R303
B
G
R
FIRE HAZARD, REPLACEMENT FUSES SHOULD BE OF THE SAME TYPE AND RATINGS ONLY.
CAUTION - FOR CONTINUED PROTECTION AGAINST
ATTENTION POUR LES PRECAUTIONS CONTINUELLES CONTRE L'INCENDIE, LES FUSIBLES A REPLACER DOIVENT ETRE LES MEME TYPES ET NORMES UNIQUEMENT.
JUMPER WIRE AT THE SD-P502-R/KC TYPE
L1 RDY
L2 GDY
L3 BDY
HDY
VDY
☆ ANODE CABL
KIT
TRANSFOR
SECONDAR
ASSEMBLY
(AWZ1953)

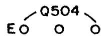
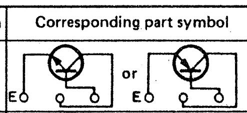
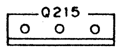
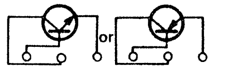
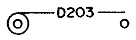
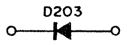
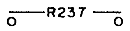
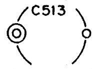
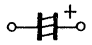
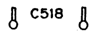
☆DEFLECTION ASSEMBLY
(AWV1029)


R CRT ASSEMBLY
(AWZ1945)
FOCUS
ANODE
SCREEN
GND
RED
CRT ASSEMBLY R
G CRT ASSEMBLY
(AWZ1946)
GREEN
CRT ASSEMBLY G
B CRT ASSEMBLY
(AWZ1947)
BLUE
CRT ASSEMBLY B
TRANSFORMER PRIMARY ASSEMBLY
(AWZ1952)
Z1
TRANSFORMER SECONDARY ASSEMBLY
(AWZ1953)
X2
X3
X4
X5
T1 POWER TRANSFORMER
E5
E6
E7
E8
E9
E10
L1 RDY
L2 GDY
L3 BDY
HDY
VDY
VR 1
FOCUS VARIABLE RESISTOR
B FOCUS ADJ
G FOCUS ADJ
R FOCUS ADJ
B SCREEN ADJ
G SCREEN ADJ
R SCREEN ADJ
7
8
9
6
4
5
3
2
1
A1
1
9
ANODE CABLE KIT
WIRE
SD -
/KC
AC120V
60Hz
M1
M2
M3
N
N2
N3
P
P2
TP-R.K
TP-G.K
TP-B.K
A
B
C
D

- ▭ mark shows the charged section (Power supply primary side circuit).
- ▨ mark shows a high voltage generation point.
- ● Parts marked by ☆ are important parts which use X-rays. If any of these parts need to be replaced, always replace with specified parts.

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

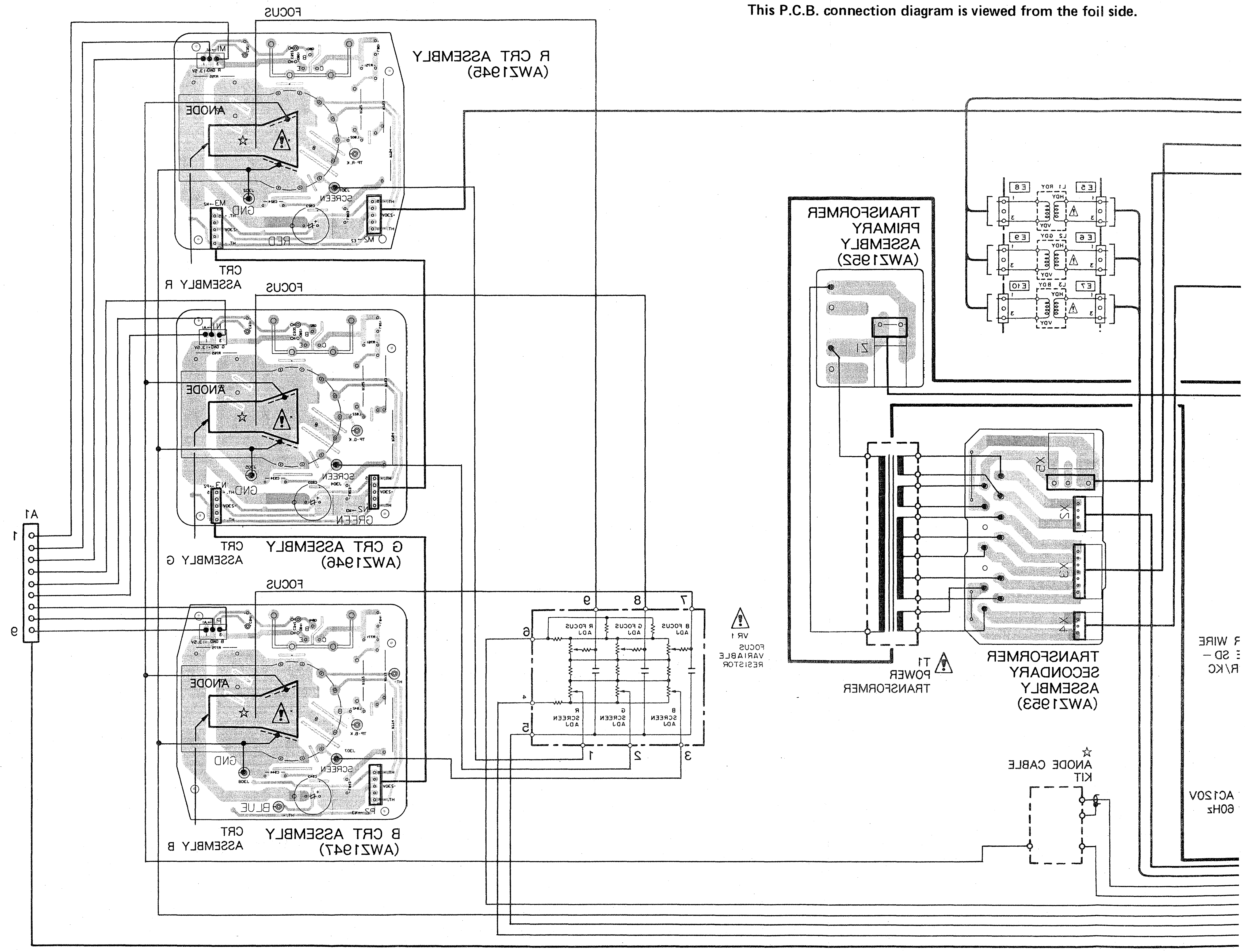
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
 Q504 E	 E or E	Transistor
 Q215	 or	Radiator type transistor
 D203	 D203	Diode
 R237	R237	Resistor
 C513		Capacitor (Polarity)
 C518		Capacitor (Non-polarity)

Others

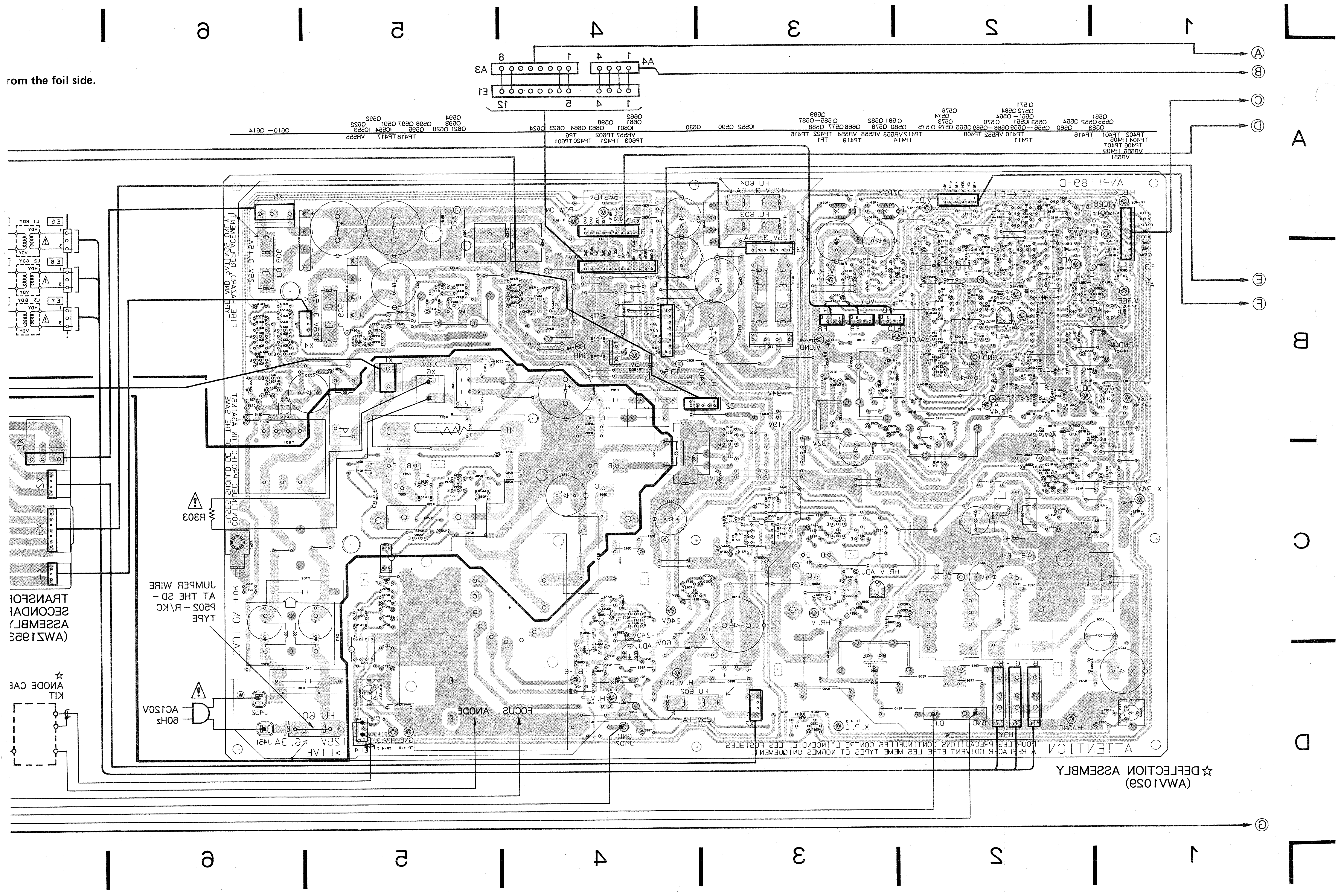
P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capacitor terminal marked with ◎ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

This P.C.B. connection diagram is viewed from the foil side.


R CRT ASSEMBLY
(AWZ1945)
G CRT ASSEMBLY
(AWZ1946)
B CRT ASSEMBLY
(AWZ1947)
CRT ASSEMBLY R
CRT ASSEMBLY G
CRT ASSEMBLY B
FOCUS
ANODE
SCREEN
GND
RED
GREEN
BLUE
A1
FOCUS VARIABLE RESISTOR
VR1
R FOCUS ADJ
G FOCUS ADJ
B FOCUS ADJ
R SCREEN ADJ
G SCREEN ADJ
B SCREEN ADJ
TRANSFORMER PRIMARY ASSEMBLY
(AWZ1952)
T1 POWER TRANSFORMER
TRANSFORMER SECONDARY ASSEMBLY
(AWZ1953)
ANODE CABLE KIT
AC120V
60Hz
E5
E6
E7
E8
E9
E10
HDY
VDY

rom the foil side.


6
5
4
3
2
1
A
B
C
D
A3
A4
E1
ANP1189-D
TRANSFORMER SECONDARY ASSEMBLY (AWZ195
X5
X2
X3
X4
R303
JUMPER WIRE AT THE SD-P502-R/KC TYPE
ANODE CAP KIT
AC120V
60Hz
J452
J451
FU 601
125V 6.3A
LIVE
FOCUS
ANODE
H.V.GND
J402
FU 602
125V 1A
FU 603
FU 604
125V 3.15A
X-RAY
ATTENTION
POUR LES PRECAUTIONS CONTINUELLES CONTRE L'INCENDIE, LES FUSIBLES A REPLACER DOIVENT ETRE LES MEME TYPES ET NORMES UNIQUEMENT.
CAUTION
DEFLECTION ASSEMBLY (AWV1029)
HDY
VDY
E5
E6
E7
E8
E9
E10
E12
E13

6. ELECTRICAL PARTS LIST

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5 %, and K = 10 %).

560 Ω→56 × 10^1 →561 ······························ RD1/4PS$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω→47 × 10^3 →473 ······························ RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω→0R5 ······························ RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω→010 ······························ RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω→562 × 10^1 →5621 ······························ RN1/4SR$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

- Parts marked by ☆ are important parts which use X-rays. If any of these parts need to be replaced, always replace with specified parts.
- Parts marked by × are important parts which use X-rays. If a failure occurs in any of these parts, replace the printed circuit board assembly where the relevant part has already been adjusted as a working component. Do not replace the actual part itself.
  If any part marked by × is replaced, there is danger of being exposed to X-rays.

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	VIDEO, TUNER assembly	AWV1027
☆	DEFLECTION assembly	AWV1029
	SURROUND assembly	AWV1030
	CONVERGENCE assembly	AWZ1944
	R.CRT assembly	AWZ1945
	G.CRT assembly	AWZ1946
	B.CRT assembly	AWZ1947
	FRONT CONTROL assembly	AWZ1948
	RECEIVER assembly	AWZ1949
	LED assembly	AWZ1950
	FRONT TERMINAL assembly	AWZ1951
	TRANSFORMER PRIMARY assembly	AWZ1952
	TRANSFORMER SECONDARY assembly	AWZ1953

OTHERS

Mark	Symbol & Description	Part No.
⚠	VR1 Focus variable resistor	ACX1014
⚠	L1 Deflection yoke (R)	ATL1034
⚠	L2 Deflection yoke (G)	ATL1035
⚠	L3 Deflection yoke (B)	ATL1036
⚠	T1 Power transformer	ATS1148
⚠	FU602 Fuse (1A/125V)	AEK-119
⚠	FU603 – FU606 Fuse (3.15A/125V)	AEK-124
⚠	FU601 Fuse (6.3A/125V)	AEK-309
⚠☆	CRT assembly G	AWY1038
⚠☆	CRT assembly R	AWY1039
⚠☆	CRT assembly B	AWY1040
	Speaker	APV1012
⚠	AC power cord	ADG-089
	Remote control unit	AXD1054
☆	Anode cable kit	GXX1024

FRONT CONTROL Assembly (AWZ1948)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q862	2SA933S
	Q861,Q863 – Q865	2SC1740S
	D861 – D869	1SS252

SWITCHES

Mark	Symbol & Description	Part No.
	S861 – S871 Tact switch (POWER, INPUT, VOLUME (+, −), AV MEMORY (1, 2), DPO, CHANNEL (+,−), ADD, ERASE)	ASG-703
	S873 Slide switch (TEST)	ASH1024
	S872 Slide switch (TV – CATV SELECTOR)	ASH1025
	S874 Slide switch (SPEAKER SELECTOR)	ASH1026

CAPACITORS

Mark	Symbol & Description	Part No.
	C953	CCDSL121J50
	C951	CEAS010M50
	C952,C955	CEAS101M16
	C954	CEAS470M10

RESISTORS

Mark	Symbol & Description	Part No.
	VR863 Semi-fixed (47kΩ)	VRTS6VS473
	VR861 Variable resistor (2kΩ) (BLUE & RED HORIZONTAL, VERTICAL)	ACS1007
	VR862 Variable resistor (5kΩ/10kΩ) (V. HOLD, BALANCE)	ACS1008
	Other resistors	RD1/8PM□□□J

VIDEO, TUNER Assembly (AWV1027)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	TH301	TH103-2
	IC203	CXD1067P
	IC202	CXK1005P
	IC103	HA11431
	IC302	M51365SP
	IC303	M5218L
	IC304	NJM78M09A
	IC101	PA0028
	IC102	PA0030
	IC201	PD5084-A
	IC305 MPX module	SBX1475-11
	IC401	TA7717AP
	IC402	TC4066BP
	IC301	TD6359P
	Q335	RN1201
	Q336	RN2203
	Q313	2SA1115
	Q101,Q106,Q107,Q117 – Q119, Q122 – Q124,Q130,Q132 – Q135, Q142,Q143,Q145,Q146,Q150,Q151, Q153,Q154,Q158,Q159,Q161,Q162, Q166,Q168,Q232 – Q234, Q302 – Q306,Q309,Q315,Q316 Q323,Q332 – Q334,Q413,Q417	2SA933S
	Q102 – Q105,Q108 – Q116,Q120, Q121,Q126,Q131,Q136 – Q141, Q147 – Q149,Q155 – Q157, Q163 – Q165,Q167,Q169, Q201 – Q203,Q211 – Q213, Q221 – Q224,Q231,Q235,Q236, Q241 – Q247,Q251 – Q258,Q301, Q307,Q308,Q312,Q314, Q317 – Q322,Q324 – Q331, Q401 – Q412,Q414 – Q416,Q418	2SC1740S
	Q310,Q311	2SC2786
	Q125	2SJ103
	Q127,Q129	2SK170
	Q128,Q144,Q152,Q160	2SK246
	D243	HZS6B1L
	D251	RD3.0ESB
	D302	RD30ESB2
	D231	RD4.3ESB
	D127	RD5.1EB
	D143 – D145	RD5.1ESB1
	D110,D115 – D118	1SS108
	D101 – D106,D108,D109, D111 – D114,D119 – D126, D129 – D132,D134,D135, D137 – D142,D146 – D148,D151, D152,D154,D156,D201,D202,D211, D221 – D223,D232 – D234,D241, D242,D252 – D257,D261 – D265, D304 – D322,D401 – D408	1SS252
	D155	RD5.6EB
	D303	1SS85
	D128,D133,D136	11E2

SWITCH

Mark	Symbol & Description	Part No.
	S401 Slide switch (SYSTEM)	ASH1009

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L301 – L303,L309 Tuning coil	ATC-226
	L311 Tuning coil	ATC-249
	L304 Tuning coil	ATC-254
	L313 FM detector coil	ATE-067
	L103 Tuning coil	ATG1006
	L305 Axial inductor	LAUR47M
	L306	LAU1R2M
	L109	LAU1R8M
	L106,L107,L113	LAU100K
	L104,L105	LAU101K
	L102,L310	LAU150K
	L312,L318 – L320	LAU2R2M
	L101	LAU220K
	L201,L202	LAU221K
	L112	LAU270K
	L108,L110	LAU330K
	L111	LAU560K
	L117 – L119	LAU6R8K
	L314,L315	LAU680K
	L114 – L116	LAU820K
	L316	LTA472J
	F304 Ceramic trap	ATF-114
	F303 Ceramic filter	ATF-166
	F301 SAW filter	ATF1019
	F302 SAW filter	ATF1046

CAPACITORS

Mark	Symbol & Description	Part No.
	C287,C288	CCCCH330J50
	C101,C103,C147,C158	CCCCH470J50
	C175,C177,C179,C215	CCCSL060D50
	C176,C178,C180,C202,C285	CCCSL121J50
	C130,C141,C144	CCCSL151J50
	C286	CCCSL180J50
	C149	CCCSL181J50
	C196	CCCSL221J50
	C142,C171	CCCSL271J50
	C109,C143,C148,C174,C193,C199, C205	CCCSL390J50

Mark	Symbol & Description	Part No.
	C131,C140	CCCSL820J50
	C281,C282	CCCUJ220J50
	C354,C356	CCDCH040C50
	C353,C357,C371	CCDCH050C50
	C123,C362,C379	CCDCH150J50
	C159,C188,C347	CCDCH220J50
	C126,C160,C410,C411	CCDCH270J50
	C369	CCDRH270J50
	C346	CCDRH470J50
	C352,C363	CCDRH560J50
	C344	CCDSH150J50
	C355	CCDSH470J50
	C382	CCDSL221J50
	C476	CCMSL100D50
	C106,C172,C197,C203,C211,C283, C284,C332,C334,,C407 – C409, C486	CCMSL101J50
	C194,C200,C206	CEANP010M50
	C183	CENAP100M16
	C477	CEANP220M10
	C156,C173	CEASR22M50
	C121,C214,C387,C401,C405	CEASR47M50
	C185,C313 – C316,C321 – C325, C370,C381,C421,C456 – C459, C469,C470	CEAS010M50
	C113,C116 – C118,C125,C128, C134,C138,C145,C153,C154,C157, C162,C165 – C167,C182,C184, C192,C207,C208,C213,C311,C376, C383,C390,C392,C395,C420,C451, C452,C467	CEAS100M50
	C108,C129,C198,C204,C212,C341, C453,C464,C482,C487	CEAS101M10
	C114,C132,C330,C351,C484	CEAS101M16
	C338	CEAS101M50
	C454,C455	CEAS102M10
	C336	CEAS102M16
	C291,C413,C417,C462,C463,C472, C473	CEAS2R2M50
	C137,C169,C460,C461,C465,C466, C475	CEAS220M16
	C124,C265,C297	CEAS221M10
	C217,C474	CEAS222M16
	C468,C471	CEAS330M25
	C399	CEAS331M16
	C168,C186,C343,C380	CEAS4R7M50
	C105,C110,C120,C139,C181,C293, C366,C386,C394,C398,C415,C479	CEAS470M16
	C261,C275	CEAS471M10
	C164,C396	CEAS471M16
	C267	CFTXA474J50
	C119	CKCYB331K50
	C135,C136,C195,C201,C255	CKCYB391K50
	C127,C302	CKCYB471K50
	C251,C292,C298	CKCYB472K50
	C209	CKCYB681K50
	C170,C397,C400,C422	CKCYX104M25
	C276,C296,C299,C303,C419	CKCYX473M25
	C294,C312,C331,C333,C342,C345, C348,C350,C358,C360,C361,C374, C375,C388,C414	CKDYB102K50
	C102,C104,C107,C115,C122,C133, C146,C150 – C152,C155,C163, C189 – C191,C216,C262,C263, C266,C271 – C274,C295,C301, C326,C337,C349,C359,C368,C372, C373,C384,C385,C389,C391,C412, C478,C480,C481,C483,C485,C488	CKDYF103Z50
	C305	CKMYB561K50
	C335,C403,C404	CQMA103J50
	C304,C377,C378,C402,C406	CQMA104J50
	C112	CQMA152J50
	C111,C339	CQMA154J50
	C161,C340	CQMA333J50

RESISTORS

Mark	Symbol & Description	Part No.
	VR201 Semi-fixed (10kΩ)	VRTS6VS103
	VR110,VR112 Semi-fixed (220Ω)	ACP1009
	VR108,VR109,VR111 Semi-fixed (470Ω)	ACP1010
	VR107 Semi-fixed (220Ω)	ACP1021
	VR101 Semi-fixed (1kΩ)	ACP1022
	VR104 Semi-fixed (2.2kΩ)	ACP1023
	VR301,VR302 Semi-fixed (4.7kΩ)	ACP1024
	VR106,VR202,VR303 Semi-fixed (10kΩ)	ACP1025
	VR103 Semi-fixed (47kΩ)	ACP1027
	VR105 Semi-fixed (100kΩ)	ACP1028
	VR102 Semi-fixed (220kΩ)	ACP1029
⚠	R641	RD1/2PMFL3R9J
	R822,R824,R825	RD1/2PMFL□□□J
⚠	R992	RD1/2PMF3R9J
	R445 – R450,R912	RD1/2PM□□□J
⚠	R642,R951,R952	RD1/4PMFL100J
	R821	RD1/4PMFL8R2J
	R743	RD1/4PM331J
⚠	R444	RS1LMF3R9J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X301 Crystal resonator	ASS-013
	X101 Crystal resonator	ASS-028
	X201 Ceramic resonator	ASS-030
	DL101 Glass delay line	ATN1011
	DL103 Delay line	ATN1013
	DL102 Delay line	ATN1018
	TV Front-end	AXF1021
	9P Pin jack	AKB1020
	6P Pin jack	AKB1054
	4P Terminal (SPEAKERS)	AKE1009
	Mini jack	AKN-207
	4P Mini DIN socket	AKP1027
	RF switch	AXF1023

R. CRT Assembly (AWZ1945)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q801	2SC2278
	D801	1SS252

COILS

Mark	Symbol & Description	Part No.
	L803	LAU101K
	L801,L802	LAU470K

CAPACITORS

Mark	Symbol & Description	Part No.
	C924 (1000p/2kV)	ACG1001
	C923	ACH-378
	C921	CEAS101M16
	C922	CKCYB681K50

RESISTORS

Mark	Symbol & Description	Part No.
	R755 Solid (47/1/2W)	ACN-225
	R752 Solid (1k/1/2W)	ACN1006
	R751	RD1/8PM103J
	R753,R754	RS3LMF332J

OTHERS

Mark	Symbol & Description	Part No.
	CRT socket	AKG1001

☆DEFLECTION Assembly (AWV1029)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	TH551	TH101-2
	IC552	M5218P
	IC553	M5223P
⚠	IC554	ON3161-Q
×	IC551	
	IC601	μ PC78M05H
	Q596	2SA1145
	Q597	2SA1265NP
	Q551,Q557,Q560 – Q562,Q565, Q568,Q569,Q572 – Q574,Q576, Q591,Q612,Q613,Q620,Q622,Q661, Q662	2SA933S
	Q578	2SB950A
	Q552 – Q556,Q559,Q563,Q564, Q566,Q567,Q570,Q571,Q575,Q581, Q585,Q586,Q593,Q594,Q610,Q611, Q614,Q624,Q663	2SC1740S
	Q580	2SC1845
	Q664	2SC2238
	Q587,Q588,Q592,Q595,Q666	2SC2705
	Q589	2SC3182NP
	Q583,Q590	2SC3332
	Q582	2SC4256
	Q577,Q579	2SD1276A
⚠	Q584,Q598	2SD1555
	Q558,Q630	2SD438
	Q621,Q623	2SD836A
⚠	D577,D582	ES1F
	D561	HZS12BL
	D644	HZS18-1L
	D622,D623	HZS20L
	D587 – D589	HZS36-1L
	D559,D560,D580,D614,D645,D646	HZS6B1L
	D570	HZS6C1L
×	D579	
⚠	D601,D620	LB154
⚠	D640,D650	RBV402
⚠	D630,D631	RB152
	D574	RD30EB
	D641	RD5.1ESB3
⚠	D569	RP1H
⚠×	D578	
⚠	D571	RU1
	D610	S1YB10
	D551,D552,D555 – D558, D562 – D568,D581,D590,D592, D593,D611 – D613,D615 – D617, D621,D642,D643	1SS252
	D585,D591	11E2
×	D553	
×	D554	
×	D572	
×	D573	

RELAY

Mark	Symbol & Description	Part No.
⚠	RY601 Relay	ASR-512

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
⚠	L601 Line filter	ATF1013
	L555 AF choke coil	ATH-059
	L551 FBT coil	ATL1026
	L552 Linearity coil	ATL1046
	L553,L554 Ferrite bead	ATX-028
	T553 Horiz. drive transformer	ATK-003
⚠	T552 Horiz. drive transformer	ATK1003
⚠×	T551 Flyback transformer	
⚠	T601 Power transformer	ATT1068

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C701,C702 (0.1/AC250V)	ACE-507
⚠	C709 – C712 (0.0068)	ACE1009
	C656 (4700p/2kV)	ACG-035
	C659,C680 (680p/2kV)	ACG-049
⚠	C704 – C707 (4700p/AC250V)	ACG-503
	C730 (330/160V)	ACH-271
	C668 (1/160V)	ACH-368
⚠	C667 (1/160V)	ACH-372
⚠	C679 (10/160V)	ACH-373
	C682 (22/250V)	ACH-395
⚠	C708 (560/200V)	ACH1042
	C742,C760,C761 (3300/50V)	ACH1066
⚠	C670 (1.2/120V)	ACH1080
	C617,C634,C644,C646,C687	CCCSL101J50
	C666,C677	CCCSL101K500
	C669	CCCSL181J50
	C678	CCCSL221K500
	C651	CEANP2R2M50
	C731	CEAS0R1M100
	C725	CEAS010M100
	C604,C616,C618,C625,C628,C630, C631,C635,C638,C639,C643,C658, C662,C665,C672,C675,C693,C695, C721,C723,C755	CEAS010M50
	C605,C609,C650,C673,C683,C686, C691,C724,C752	CEAS100M50
	C655	CEAS101M16
	C649	CEAS2R2M50
	C753	CEAS220M25
	C654	CEAS220M50
	C614,C663,C685,C756	CEAS221M16
	C647	CEAS221M25
	C642	CEAS221M50
	C648	CEAS222M25
	C740,C741	CEAS222M35
	C743	CEAS222M50
	C611	CEAS330M16
	C622,C697	CEAS331M16
	C720	CEAS332M16
	C750	CEAS332M35
	C619	CEAS4R7M50
	C653	CEANP4R7M35
	C652,C722	CEAS470M25
	C641	CEAS470M50
	C681	CFPA123H1200
	C661	CFPA822H1200
	C626	CFTXA474J50
	C610,C612	CGMYX103M16
	C640,C645,C696	CKCYB102K50
	C657,C671,C692	CKCYB102K500
	C620,C676	CKCYB331K50
	C674	CKCYB392K50
	C664,C699	CKCYB222K50
	C613,C621	CKCYF103Z50
	C601,C684,C688	CKCYF473Z50
	C606	CKCYX104M25
	C754	CKDYB681K50
	C689,C690,C713	CKDYF103Z50
	C751,C757,C758	CKDYX473M25
	C636	CQMA103J50
	C694	CQMA103K250
	C624,C633	CQMA104J50
	C602	CQMA153J50
	C607,C615	CQMA223J50
	C627	CQMA473J50
	C623	CQMA682J50
	C603	CQMA683J50
	C660	CQPA683J400
	C608	CQSA562J50

RESISTORS

Mark	Symbol & Description	Part No.
	VR552 Semi-fixed (1kΩ)	VRTS6VS102
×	VR556	
	VR558 Semi-fixed (2.2k)	VRTS6VS222
	VR551,VR557 Semi-fixed (4.7kΩ)	VRTS6VS472
×	VR555	
	VR554 Semi-fixed (2.2kΩ)	ACP1023
	VR553 Simi-fixed (100Ω)	ACP1031
⚠	R301,R302 Solid (2.2M)	ACN-209
	R265 Solid (47/1/2W)	ACN-225
⚠	R210 Solid (33k/1/2W)	ACN1011
⚠	R342,R347 Wire wound (22/10W)	ACN1029
⚠	R257 Wire wound (15/20W)	ACN1039
⚠	R303 Wire wound (2.2/10W)	ACN-186

Mark	Symbol & Description	Part No.
⚠	R361,R362	RD1/2PMFL100J
⚠	R214	RD1/2PMFL101J
⚠	R363,R364	RD1/2PMFL180J
⚠	R360,R365	RD1/2PMFL3R9J
⚠	R238	RD1/2PMFL331J
⚠	R304,R305	RD1/2PM104J
	R186,R204,R231,R234,R247,R252, R281	RD1/2PM□□□J
⚠	R280	RD1/4PMFL101J
	R131,R132,R344,R345	RN1/4PQ□□□□F
⚠	R370,R371	RS1LMFR22J
	R263,R264	RN1/2PC□□□□F
	R181,R182,R381	RS1LMF□□□J
	R107,R260,R283	RS2LMF□□□J
	R205 − R209,R334,R346,R350, R351,R380	RS3LMF□□□J
×	R268	
⚠×	R261	
×	R266	
×	R267	
×	R240	
⚠	R258	RT7PH821K
	Other resistors	RD1/8PM□□□J

FRONT TERMINAL Assembly (AWZ1951)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q870,Q871	2SC1740S

CAPACITORS

Mark	Symbol & Description	Part No.
	C960,C961	CEJA010M50
	C962	CEJA100M16

RESISTORS

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	1P Pin jack	AKB1062
	1P Pin jack	AKB1063
	1P Pin jack	AKB1064

CONVERGENCE Assembly (AWZ1944)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC705,IC706	M5220L
	IC704	NJM79M15A
	IC701	PA0021A
	IC702,IC703	TC4011BP
	IC707	μPC78M12H
	Q701,Q702,Q705,Q706,Q714, Q715,Q718,Q719,Q723,Q724,Q735, Q736,Q746,Q762,Q763,Q782,Q783	2SA933S
	Q751,Q771,Q791	2SA979
	Q764,Q784	2SA992
	Q756,Q766,Q776,Q786,Q796	2SB950A
	Q744	2SB951A
	Q703,Q704,Q707,Q711 − Q713, Q716,Q717,Q721,Q722, Q727 − Q734,Q737 − Q741, Q747 − Q750,Q752,Q753,Q767, Q772,Q773,Q777,Q787,Q792,Q793, Q797	2SC1740S
	Q754,Q774,Q794	2SC1845
	Q742,Q743	2SC2235
	Q761,Q781	2SC2259
	Q720,Q725,Q726	2SC3064
	Q755,Q765,Q775,Q785,Q795	2SD1276A
	Q745	2SD1277A
	D701 − D706,D721 − D724, D731 − D734,D741 − D744, D751 − D754,D761 − D764, D771 − D776	1SS252
	D711,D712	11E2

COIL

Mark	Symbol & Description	Part No.
	L701	LAU470K

CAPACITORS

Mark	Symbol & Description	Part No.
	C880 − C883,C909	CCCSL100D50
	C913	CCCSL121J50
	C914	CCCSL151J50
	C852	CCCSL181J50
	C879,C900	CCCSL330J50
	C863 − C870	CCCSL470J50
	C904	CCCSL680J50
	C805,C808,C809	CENAP010M50
	C811	CEANP100M16
	C806	CENAP2R2M50
	C812	CEANP3R3M50
	C830,C831,C847,C850,C853, C854,C859 − C862	CEAS010M50
	C818 − C823,C836,C837,C843, C845,C848,C851	CEAS100M25

Mark	Symbol & Description	Part No.
	C814,C815,C838,C841,C901	CEAS101M16
	C887 – C889	CEAS101M25
	C891,C893	CEAS101M35
	C895,C897	CEAS101M50
	C842	CEAS2R2M50
	C839,C840,C844,C856,C858	CEAS220M16
	C871 – C878	CEAS221M10
	C826	CEAS221M16
	C884	CEAS330M50
	C824,C825,C846,C857,C905	CEAS4R7M50
	C817,C835,C849	CEAS470M16
	C829	CEAS471M16
	C915	CKCYB102K50
	C908,C911	CKCYB471K50
	C816,C832,C885,C886,C890,C892, C894,C898,C899,C902,C903,C907, C912	CKCYF103Z50
	C855	CQMA102J50
	C803	CQMA103J50
	C807	CQMA152J50
	C801,C906	CQMA154J50
	C910	CQMA182J50
	C810,C813	CQMA224J50
	C828	CQMA823J50
	C802	CQMA821J50
	C804	CQMA681J50

RESISTORS

Mark	Symbol & Description	Part No.
	VR705 Semi-fixed (10kΩ)	VRTS6VS103
	VR708 Semi-fixed (2.2kΩ)	VRTS6VS222
	VR707 Semi-fixed (22kΩ)	VRTS6VS223
	VR706 Semi-fixed (47kΩ)	VRTS6VS473
	VR709 Semi-fixed (470kΩ)	VRTS6VS474
	VR713,VR715,VR721 – VR729, VR731 – VR737,VR739, VR741 – VR749,VR751 – VR757, VR759 Semi-fixed (4.7kΩ)	ACP1024
	VR771,VR772 Semi-fixed (10kΩ)	ACP1025
	VR701,VR702,VR773 Semi-fixed (22kΩ)	ACP1026
	VR703,VR762 Semi-fixed (47kΩ)	ACP1027
	VR761 Semi-fixed (100kΩ)	ACP1028
	R505	RD1/2PMFL560J
	R453,R463,R473,R483,R489,R493	RD1/2PM□□□J
	R451,R452,R454,R457,R461,R462, R464,R467,R471,R472,R474,R477, R481,R482,R484,R487,R491,R492, R494,R497,R506 – R508	RD1/4PMFL□□□J
	R421,R424,R427,R430,R433,R509, R510	RD1/4PM□□□J
	R455,R456,R458,R465,R466,R468, R475,R476,R478,R485,R486,R488, R495,R496,R498,R504,R703	RS1LMF□□□J
	Other resistors	RD1/8PM□□□J

G. CRT Assembly (AWZ1946)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q821	2SC2278
	D821	1SS252

COILS

Mark	Symbol & Description	Part No.
	L823	LAU101K
	L821,L822	LAU470K

CAPACITORS

Mark	Symbol & Description	Part No.
	C934 (1000p/2kV)	ACG1001
	C933	ACH-378
	C931	CEAS101M16
	C932	CKCYB681K50

RESISTORS

Mark	Symbol & Description	Part No.
	R765 Solid (47/1/2W)	ACN-225
	R762 Solid (1k/1/2W)	ACN1006
	R761	RD1/8PM103J
	R763,R764	RS3LMF332J

OTHERS

Mark	Symbol & Description	Part No.
	CRT socket	AKG1001

LED Assembly (AWZ1950)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D893	AEL-434
	D891,D894	AEL-435
	D892	AEL1047

SURROUND Assembly (AWV1030)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC461,IC462,IC467	BU4066BL
	IC460	LA2730
	IC456	LM3364K-15
	IC455	M50199P
	IC453,IC457 – IC459	M5218L
	IC465	M5222L
	IC454	M5233P
	IC452	NJM79L15A
	IC466	TA7630P
	IC468	TA8200AH
	IC451	μPC78L15A
	IC463	μPD4011BC
	Q456 – Q460	DTA124ES
	Q451 – Q455,Q463 – Q472	2SC1740S
	D456	RD5.1ESB
	D457,D458	RD6.8ESB2
	D451 – D455,D459 – D470	1SS252

SWITCH

Mark	Symbol & Description	Part No.
	S451 Slide switch (BUILT – IN SURROUND PROCESSOR)	ASH1015

COILS

Mark	Symbol & Description	Part No.
	L451,L452 AF choke coil	ATH-133
	L453	LAU101K

CAPACITORS

Mark	Symbol & Description	Part No.
	C507,C556,C557	CCCSL220J50
	C539	CCCSL470J50
	C518	CEANP100M50
	C505,C506	CEANP220M25
	C530,C532,C549	CEASR33M50
	C511	CEANP4R7M35
	C564	CEASR68M50
	C529,C531,C535,C538,C540, C541,C547,C550,C552	CEAS010M50
	C503,C504,C508,C520,C551,C555, C558,C596	CEAS100M50
	C493,C509,C525,C543	CEAS101M16
	C534,C573	CEAS102M16
	C562,C563,C566,C567,C584,C585, C588,C589	CEAS2R2M50
	C492,C544	CEAS220M16
	C494,C495	CEAS221M10
	C491,C565	CEAS221M16
	C599,C600	CEAS222M35
	C590,C591	CEAS330M25
	C526,C570,C574 – C576, C581 – C583	CEAS470M10
	C512	CEAS470M16
	C592,C594	CEAS470M50
	C595	CEAS471M50
	C510	CFTXA103J50
	C513,C516,C548	CFTXA104J50
	C572,C580,C597,C598	CFTXA124J50
	C546,C554	CFTXA333J50
	C537,C568,C569	CFTXA683J50
	C527,C528	CFTXA823J50
	C593	CKCYB103K50
	C542	CKCYB471K50
	C577,C578	CKCYB561K50
	C571,C579	CKCYF472Z50
	C524	CKCYX103M25
	C496	CKDYF473Z50
	C522,C523	CKDYB102K50
	C501,C502	CQMA393J50
	C545	CQMA472J50
	C515,C517	CQMA562J50
	C536,C553	CQMA682J50
	C521	CQMA822J50
	C514,C519	CQSA561J50

RESISTORS

Mark	Symbol & Description	Part No.
	VR452 Semi-fixed (22kΩ)	VRTS6VS223
	VR451 Variable resistor (SURROUND BALANCE)	ACT1030
	R560,R561	RD1/2PM152J
⚠	R558,R559,R994	RD1/4PMFL100J
⚠	R556,R557	RD1/4PMFL2R2J
⚠	R979,R980,R981	RD1/4PMFL220J
	R903	RD1/4PM821J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X451 Ceramic resonator	ASS1016
	2P Pin jack	AKB-093

B. CRT Assembly (AWZ1947)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q841	2SC2278
	D841	1SS252

COILS

Mark	Symbol & Description	Part No.
	L843	LAU101K
	L841,L842	LAU470K

CAPACITORS

Mark	Symbol & Description	Part No.
	C944 (1000p/2kV)	ACG1001
	C943	ACH-378
	C941	CEAS101M16
	C942	CKCYB681K50

RESISTORS

Mark	Symbol & Description	Part No.
	R775 Solid (47/1/2W)	ACN-225
	R772 Solid (1k/1/2W)	ACN1006
	R771	RD1/8PM103J
	R773,R774	RS3LMF332J

OTHERS

Mark	Symbol & Description	Part No.
	CRT socket	AKG1001

RECEIVER Assembly (AWZ1949)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D881	AEL1047
	PC881	SC-05-8S

RESISTORS

Mark	Symbol & Description	Part No.
	R560,R561	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Remote control sensor unit	AXX1005

TRANSFORMER PRIMARY Assembly (AWZ1952)

There is not supplied part in this assembly.

TRANSFORMER PRIMARY Assembly (AWZ1953)

There is not supplied part in this assembly.

7. ADJUSTMENT

- Adjustment items are described as follows.

7.1 When DEFLECTION assembly is repaired
  7.1.1 Power supply section
  7.1.2 Deflection section
7.2 When DEFLECTION assembly is replaced
  7.2.1 Power supply section
  7.2.2 Deflection section
7.3 When VIDEO, TUNER assembly is repaired
  7.3.1 Video section
  7.3.2 Microcomputer section
  7.3.3 Tuner section
7.4 When VIDEO, TUNER assembly is replaced
  7.4.1 Video section
  7.4.2 Microcomputer section
  7.4.3 Tuner section
7.5 When CRT assembly R, G or B is replaced
7.6 When SURROUND assembly is replaced or repaired
7.7 When R, G or B CRT assembly is repaired or replaced
7.8 When CONVERGENCE assembly is repaired or replaced
7.9 When FRONT CONTROL assembly is repaired or replaced
7.10 When RECEIVER assembly is repaired or replaced
7.11 When lens assembly is replaced
7.12 When other assemblies are repaired or replaced
7.13 DPO level setting
7.14 DPO sensitivity adjustment
7.15 Anode voltage measuring method

- These adjustment procedures are described separately for adjustments following assembly exchange and adjustments following repairs.
- When replacing the assemblies, always use recommended replacements.
- Symbols in parentheses next to the adjustment position ( ) indicate denotes the relevant assembly to be adjusted.

V : VIDEO, TUNER assembly
C : CONVERGENCE assembly
F : FRONT CONTROL assembly
D : DEFLECTION assembly
S : SURROUND assembly
VR : Focus variable resistor (VR1)
IC : MPX module (IC305) in the VIDEO, TUNER assembly

- The adjustment points and TP terminals on the each assemblies are shown in Fig. 7-1 thru 7-3.

Fig. 7-1 : VIDEO, TUNER assembly and rear panel, SURROUND assembly, DEFLECTION assembly.
Fig. 7-2 : Front panel and FRONT CONTROL assembly, CONVERGENCE assembly
Fig. 7-3 : Lens assembly (Red, Green, Blue), B CRT assembly, G CRT assembly, deflection yoke.

- Set the input terminals at the rear panel as follows unless otherwise noted.

VIDEO signal : INPUT VDP VIDEO terminal
AUDIO signal : INPUT VDP AUDIO terminal

- Set the picture quality to standard (screen displayed "STD") by remote control unit unless otherwise noted.

7.1 WHEN DEFLECTION ASSEMBLY IS REPAIRED

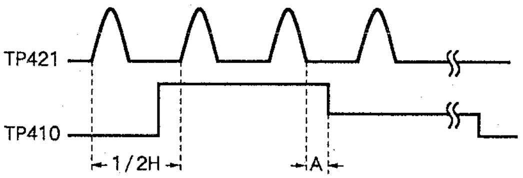
Note : VR555 and VR556 are protected by the shield covers (ANH1166) so that they can not be adjusted. Do not try to turn these volumes by removing their shield covers.

7.1.1 Power supply section

- No adjustment required.

7.1.2 Deflection section

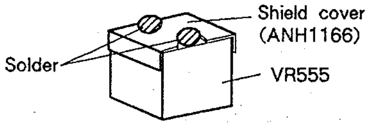
- All adjustment test points (TP) are located in the DEFLECTION assembly.

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	H. OUT power supply adjustment	Monoscope signal	VR558 (D)	Adjust TP422 voltage to 117V ± 0.2V.
2	Horizontal AFC adjustment	No signal	VR551 (D)	Adjust TP402 to 15.734kHz ± 50Hz.
3	Focus adjustment	Cross hatch signal	Focus VR (VR)	Optimize the focus of each CRT assembly. (Focus is easier to judge if red and blue are displaced by turning the convergence control knobs on the front control panel as shown in Fig. 7-2. Readjust these knobs to their original positions after completing the focus adjustment.)
4	Vertical size adjustment	Monoscope signal or ordinary broadcasting	VR553 (D)	Adjust to 92% ± 1% when using the monoscope signal, and adjust so that the screen picture does not lack any part of the entire picture field when using the ordinary broadcasting.
5	Horizontal size adjustment		VR554 (D)	
6	Vertical pulse width adjustment	Black burst signal	VR552 (D)	Monitor TP410 and TP421 together and adjust A in shown below to 8 ± 1μsec. 
7	White balance adjustment	Ordinary broadcasting	Cut off VR (V) VR108 (R) VR110 (G) VR111 (B)	Adjust the white if proper adjustment cannot be achieved as follows. Set the COLOR by the remote control to minimum, adjust the cut off VRs to obtained best picture.
8	+ 240V adjustment	Monoscope signal	VR557 (D)	Adjust the voltage of TP420 to 7V ± 0.2V.

7.2 WHEN DEFLECTION ASSEMBLY IS REPLACED

Note : As VR555 in the DEFLECTION assembly supplied as a spare part are not protected by the shield cover (ANH1166), do the followings :

1. When ordering the DEFLECTION assembly, also order the shield cover.
2. Cover VR555 of the DEFLECTION assembly with the shield cover and solder the top position as shown below. (Never turn VR555.)



7.2.1 Power supply section

- No adjustment required.

7.2.2 Deflection section

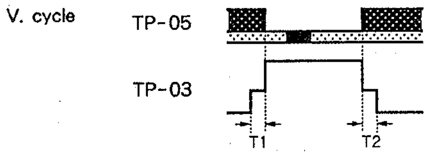
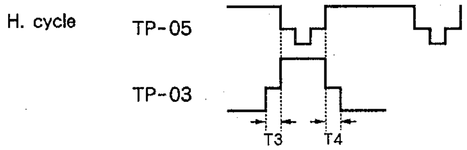
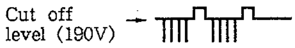
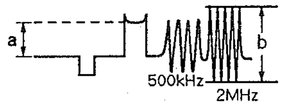
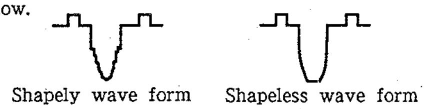
- Adjust focus, vertical size, horizontal size, vertical pulse width and white balance as described in section 7.1.2.

7.3 WHEN VIDEO, TUNER ASSEMBLY IS REPAIRED

- Refer to Fig. 7-1.

7.3.1 Video section

- Adjustment test points (TP) are located in the VIDEO, TUNER assembly unless otherwise noted (Refer to Fig. 7-1).

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	Comb filter adjustment	Color bar	VR101, L103 (V)	Adjust TP-01 3.58MHz component to minimum level.
2	Black level correction, blanking width adjustment	White : 100 %	VR102 (V)	Monitor TP-05 and TP-03 together and adjust T1 in V. cycle shown below to 250µsec (±50µsec). 
3			VR103 (V)	With the same set-up as in step 2, adjust T3 in H. cycle shown below to 0.8µsec (±200nsec). 
4	APC adjustment	Color bar	VR105 (V)	Monitor TP-06 in V. cycle, and minimize the waveform.
5	White balance adjustment	Color bar signal without color signal	Screen VR (R),(B) (VR1)	Adjust the screen VRs (R) and (B) until grey color can just be seen in the black area. (Do not move the green VR at this stage.)
			VR109 (R) VR112 (B) Drive VR (V)	Using the drive VR, adjust the white area to 100% white.
			VR108 (R) VR110 (G) VR111 (B) Cut off VR (V)	Adjust the white with the cut off VR only if proper adjustment cannot be achieved with the screen VRs (R and B) and the drive VR. (The cut off VR should be moved as little as possible.)
6	Pre-bright adjustment	No input signal	VR104 (V)	Adjust the black level voltage of TP-13 to 5.2V±0.1V.
7	Sub-bright adjustment	–	VR773 (C)	Minimize sub-color VR (VR773). (After this adjustment, adjust sub-color as described in step No. 10).
8		Cross hatch signal	VR771 (C)	Adjust the cut off level at TP-GK of G. CRT assembly to 190V. (After adjustment, confirm the white balance.) 
9	Standard PIONEER setting Sub-sharpness adjustment	Multi burst	VR106 (V)	At TP-05, set the rate of b (peak-to-peak value at 2MHz) to a (level from black to white) as follows. a : b = 3 : 5 (+4.4dB) 
10	Sub-color adjustment	Color bar	VR773 (C)	Adjust the chroma signal at TP-42 to 640mVp-p.
11	Sub-tint adjustment		VR772 (C)	Adjust screen to optimum condition.
12	Sub-contrast adjustment		VR202 (V)	Adjust screen to optimum condition.
13		Free signal	–	At the TP-BK of B. CRT assembly, confirm that the signal is shaped as shown below. 
14	Blue tailing adjustment	Cross signal	–	Adjust the SG output of the input cross signal to maximum level.
				Maximize contrast by remote control.
			VR107 (V)	Turn VR107 fully counter clockwise (resulting in blue tailing.).
				Turn the VR clockwise until there is no blue tailing at the vertical cross line on the screen.

7.3.2 Microcomputer section

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	Telop position	Signal with synchronizing signal meaning	VR201 (V)	Generate TONE (treble or bass) telop, and adjust to center of screen.
2	DPO level adjustment	This adjustment only needs to be carried out if IC202 (CXK1005P non-volatile memory) is replaced or if the DPO level is changed when a peripheral circuit is repaired. The adjustment procedure is described in Section 7.13 .		

7.3.3 Tuner section

- Adjustment test points (TP) are located in the VIDEO, TUNER assembly unless otherwise noted. (Refer to Fig. 7-1).
- When adjusting the tuner section, switch to TEST mode and stop SEARCH and AFT operations.

  Test mode setting : Short TP208 to TP207, and ground TP203 at moment.

  Test mode cancel : Remove short from between TP208 and TP207, and switch the POWER OFF and ON again.
- Input signal : Channel 9 unless otherwise noted. (Other channels may be selected if channel 9 is not available.)

Video

V① ; f_v = EIA color bar, 60dBμV

V② ; f_v = EIA color bar, 25dBμV

Audio (MONO)

S① ; f_A = 1kHz, 100 % MOD, 54dBμV

Audio (STEREO) ; dbx noise reduction ON, pre-emphasis ON

S② ; f_A = 5kHz, 30 % MOD, 54dBμV, L channel only (or R channel only)

S③ ; f_A = 300Hz, 30 % MOD, 54dBμV, L channel only (or R channel only)

S④ ; f_A = 5kHz, 30 % MOD, 19dBμV,

- Connect as shown in Fig. 7-4.

Video System

Step No.	Adjustment item	Input signal		Adjustment point	Adjustment procedure
		Video	Audio		
1	Adjacent audio trap	8ch V①	S①	L303 (V)	Adjust TP301 47.25MHz component to minimum level.
2	Adjacent video trap	10ch V①	S①	L301 (V)	Adjust TP301 39.75MHz component to minimum level.
3	Audio trap	V①	Audio carrier unmodulated	L302 (V)	Adjust TP301 41.25MHz component to minimum level.
4	Synchronous detection		S①	–	Short TP305 to GND, and measure TP302 voltage.
5				L311 (V)	Open TP305, and adjust the TP302 voltage to the voltage measured in step 4.
6	RF AGC			VR302 (V)	Adjust the TP306 voltage to 6.5V.
7	AFT			L309 (V)	Adjust the TP308 voltage to 5.5V.
8	VIDEO output			VR301 (V)	Adjust the OUTPUT TV VIDEO terminal output level to 1Vp-p when that terminal is terminated by 75 ohms.

Audio System

Step No.	Adjustment item	Input signal		Adjustment point	Adjustment procedure
		Video	Audio		
1	Audio detection	V①	S①	L313 (V)	Adjust OUTPUT TV AUDIO distortion to minimum level.
2	Separation		S②	RV06 (IC)	Adjust OUTPUT TV AUDIO R (or L) channel output to minimum level.
3			S③	RV03 (IC)	
4	Repeat steps 2 and 3 to obtained best separation.				
5	FORCED MONO	V②	S④	VR303 (V)	Adjust to position where front STEREO indicator lights up.

NOTE : Do not replace or repair parts inside the IC305 (Audio MPX IC SBX1475-11).

7.4 WHEN VIDEO, TUNER ASSEMBLY IS REPLACED

- Refer to Fig. 7-1.

7.4.1 Video section

- Adjust black level correction blanking width, white balance, sub-bright, blue tailing, and set the standard PIONEER settings as described in Section 7.3.1.

  Also confirm the pre-bright level is as the section 7.3.1 before sub-bright adjustment.

7.4.2 Microcomputer section

- Adjust telop position adjustment in section 7.3.2 and set the DPO level in section 7.13.

7.4.3 Tuner section

- No adjustment required.

7.5 WHEN CRT ASSEMBLY R, G, OR B IS REPLACED

- The CRT assembly R, G, B replacement procedure is described in Section 10.
- When one or two tubes are replaced, match the new tubes with the remaining tube. If all three tubes are replaced, first adjust G, and then match the other two tubes with the G tube.

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	Deflection yoke angle and centering adjustment	Cross signal (or apply any signal, and switch TEST switch S873 ON to generate a cross test signal)	Centering magnet of deflection yoke of replaced CRT assembly (Refer to Fig. 7-3)	Adjust the deflection yoke angle until the color cross of the replaced CRT assembly is parallel with the color cross of a CRT assembly which has not been replaced. Turn the convergence control knob on the front as shown in Fig. 7-2. to the center position when the red or blue CRT assembly is replaced (but leave unchanged when the green CRT assembly is replaced). (Refer to Fig.7-2) Adjust the centering magnet of the deflection yoke in the replaced CRT assembly until cross becomes white.
2	Focus adjustment	Cross hatch	Replaced color focus VR (VR1) and lens assembly connected to replaced CRT assembly (Refer to Fig. 7-1 and Fig. 7-3)	Adjust the focus of the replaced CRT assembly to optimum condition. (The focus is easier to see if red and blue are displaced by turning the convergence control knob at this time. But remember to turn the knob back after completing the adjustment.)
3	Convergence adjustment		Match the color convergence of the replaced CRT assembly with the color an assembly which has not been replaced. See Section 8. CONVERGENCE ADJUSTMENT for details on the matching procedure. (When CRT assembly G is replaced, match the color convergence of the R, G and B.)	
4	White balance	Color bar signal without color signal	Screen VR (VR1) VR109 (R) } Drive VR VR112 (B) } (V) VR771 (Sub-bright) (C) (Refer to Fig. 7-1)	Set standard values by remote control unit. Adjust the replaced color screen VR until grey can faintly be seen in the black area. Adjust the replaced color drive VR until the white area becomes 100 % white. (When CRT assembly G is replaced, slightly adjust the drive VR (R) and (B).) Adjust sub-bright if proper adjustment cannot be achieved by the above methods.
5	Standard PIONEER settings	Adjust as described in steps 9 thru 12 in Section 7.3.1.		

ɘ
ıe color cross of the the color cross of a ced.
he front as shown in he red or blue CRT ged when the green g.7-2)
flection yoke in the nes white.
ıssembly to optimum if red and blue are :ontrol knob at this ack after completing
ıe color an assembly 'MENT for details on :he color convergence
nit.
l grey can faintly be
ntil the white area mbly G is replaced, .)
ınnot be achieved by

7.6 WHEN SURROUND ASSEMBLY IS REPLACED OR REPAIRED

- Connect the 8Ω load resistor at EXT. SP terminal.
- Set S874 (SPEAKER SELECTOR) to EXT and S451 (BUILT-IN SURROUND PROCESSOR) at the rear to ON.
- Set the surround mode to DOLBY, minimize front volume and maximize surround volume by the remote control.
- Set VR451 (SURROUND BALANCE) at the rear to center.
- Input signal : 1kHz sinewave, 500mV/rms, VDP Audio L ch (or R ch).
- Adjustment test points (TP) are located in SURROUND assembly (Refer to Fig. 7-1).

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	Dolbly level adjustment	VR452 (S)	Adjust the TP DOLBY LEVEL ADJ to 100mV (rms) ±5%.

7.7 WHEN R, G, OR B CRT ASSEMBLY IS REPAIRED OR REPLACED

- White balance should require very little adjustment, but if necessary, adjust as described in step 7 of Section 7.1.

7.8 WHEN CONVERGENCE ASSEMBLY IS REPAIRED OR REPLACED

- Adjust convergence as described in Section 8. CONVERGENCE ADJUSTMENT. And adjust sub-bright, sub-color, and sub-tint as described in steps 7, 10, and 11 in Section 7.3.1 Video section.

7.9 WHEN FRONT CONTROL ASSEMBLY IS REPAIRED OR REPLACED

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	POSITION	Test cross signal (Input free signal and set S873 to ON.)	VR861-1~4 (F) (convergence control knob)	Adjust so that the red and blue converge the green of cross signal to obtained white.
2	V-HOLD	Free signal	VR862-1 (F)	Adjust so that the screen picture does not flow vertically.
3	L, R balance adjustment	Free audio signal to AUDIO input terminal	VR862-2 (F)	Adjust to the center click point.
4	DPO sensitivity adjustment	Adjust DPO sensitivity adjustment as described in section 7.14.		

7.10 WHEN RECEIVER ASSEMBLY IS REPAIRED OR REPLACED

- When DPO level is setting as described in section 7.13, proceed to section 7.14 and adjust DPO sensitivity.

7.11 WHEN LENS ASSEMBLY IS REPLACED

- Adjust the focus of the replaced lens assembly as shown in Fig. 7-3.

7.12 WHEN OTHER ASSEMBLIES ARE REPAIRED OR REPLACED

- No adjustment required.

7.13 DPO LEVEL SETTING

The DPO function features a DPO light-sensitive section in the front control panel designed to judge the level of external light when the front panel DPO switch (S871) in ON, thereby matching the PROJECTION MONITOR RECEIVER picture quality (contrast, color, bright) with the external light.
Although picture quality is standard under bright conditions, the quality is changed if the environment becomes dark, and is changed to a fixed level if the environment becomes completely dark. This picture quality level is stored in a non-volatile memory (IC202).
Hence, if IC202 (or peripheral circuits) is repaired or replaced, or if VIDEO, TUNER assembly is replaced, picture quality must be stored in IC202 again. This procedure is outlined below. (Since this procedure is included in the operating instructions, it can also be carried out by the user.)

(1) Make the environment dark.
(2) Match the picture quality (contrast, color and bright) to the level of light in the environment by remote control. (Also take the customer's wishes into consideration.)
(3) Press the front control panel switches VOLUME − (S864), + (S863), and DPO (S871) together. (Refer to Fig. 7-2.)

The picture quality set in step (2) is thus stored in memory. The default values set prior to shipment from the factory are given below for reference.

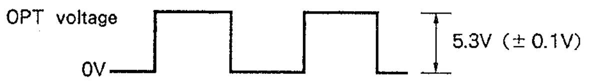
Contrast	−15
Color	−2
Bright	+3

Note : Values subject to possible modification without notice, due to improvements.

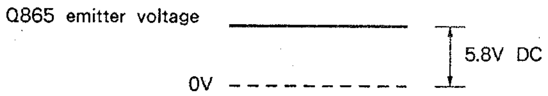
7.14 DPO SENSITIVITY ADJUSTMENT

The sensitivity of the DPO light-sensitive section is adjusted to determine the level of external light at which the DPO feature is activated. This adjustment is made by VR863 in the FRONT CONTROL assembly (refer to Fig. 7-2), and should be carried out according to the customer's preferences. The adjustment procedure used at the factory is given for reference.

(1) Using an incandescent light bulb as the light source, light is beamed directly into the DPO light sensitive section with a light-intensity level of 50 lux at the DPO.
(2) Switch the DPO switch (S871) on.
(3) FRONT CONTROL assembly VR863 is adjusted to obtain a voltage of 5.3V (±0.1V) at pin 10 (OPT) of connector B2.



(4) If voltage cannot be measured at pin 10 of connector B2, adjust the Q865 emitter voltage to 5.8V DC by VR863.



Note : Refer to Fig. 7-2.
Note : Values subject to possible modification without notice, due to improvements.

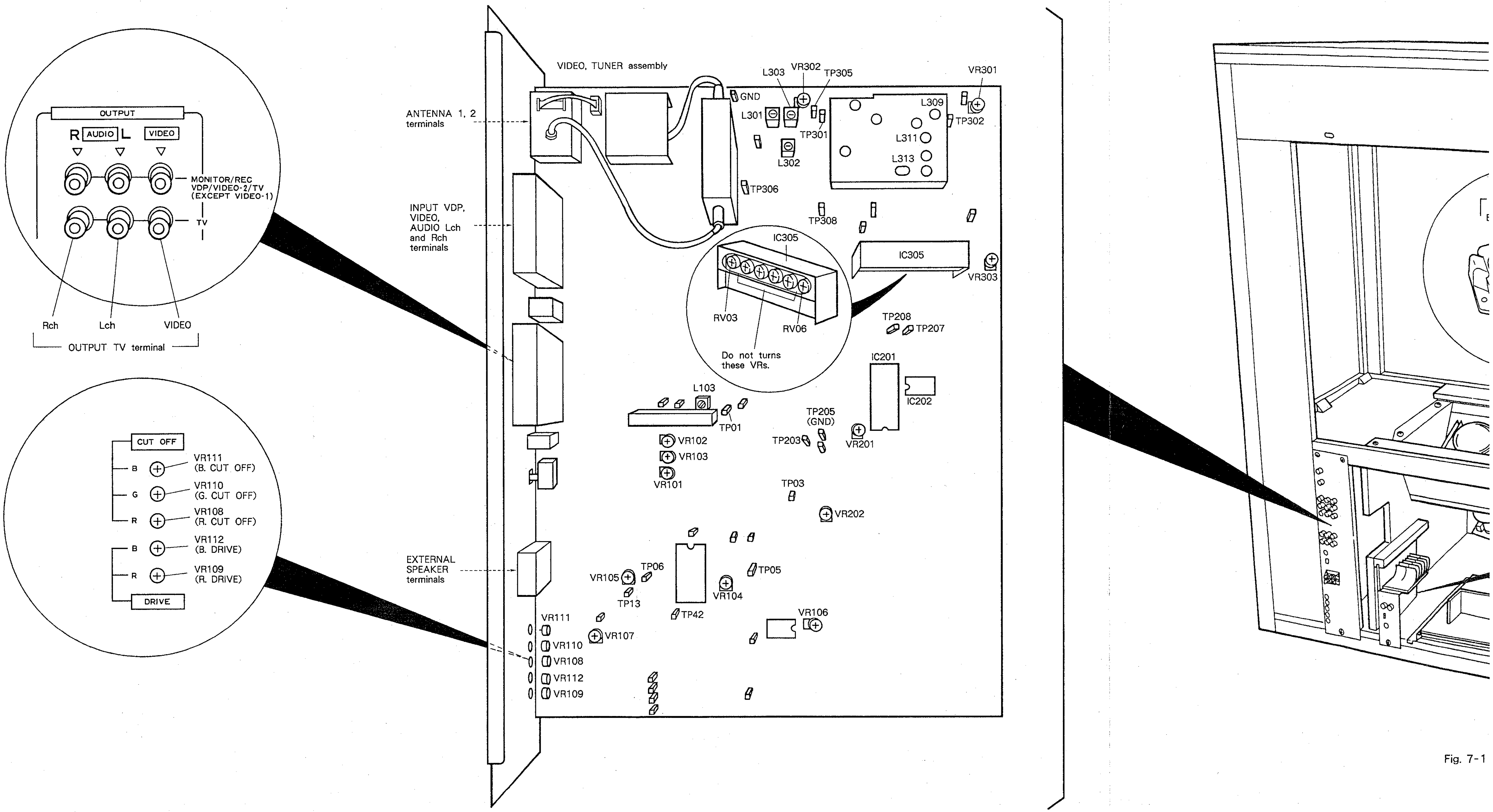
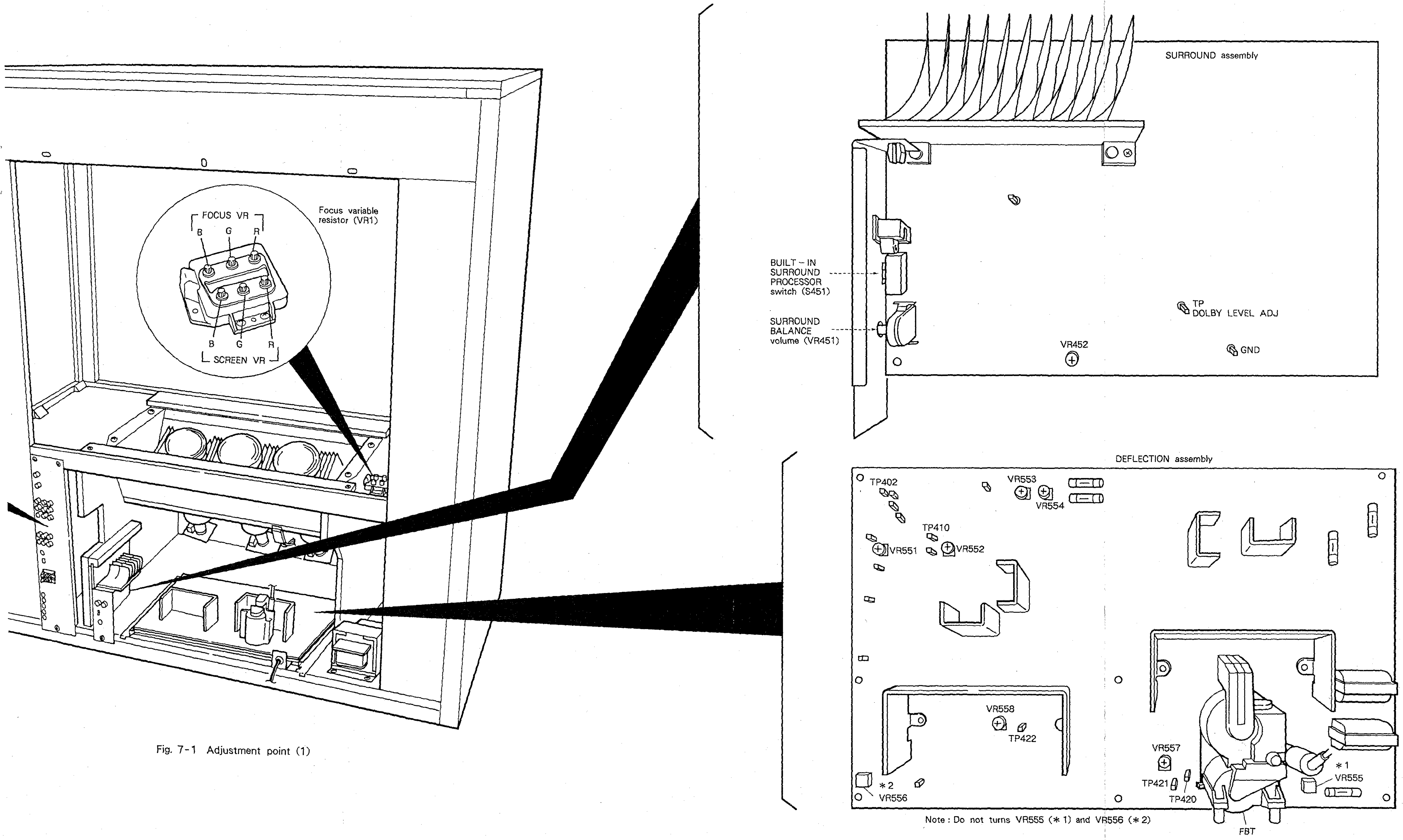

OUTPUT
R AUDIO L
VIDEO
MONITOR/REC
VDP/VIDEO-2/TV
(EXCEPT VIDEO-1)
TV
Rch
Lch
VIDEO
OUTPUT TV terminal
CUT OFF
B
G
R
VR111
(B. CUT OFF)
VR110
(G. CUT OFF)
VR108
(R. CUT OFF)
VR112
(B. DRIVE)
VR109
(R. DRIVE)
DRIVE
VIDEO, TUNER assembly
ANTENNA 1, 2
terminals
INPUT VDP,
VIDEO,
AUDIO Lch
and Rch
terminals
EXTERNAL
SPEAKER
terminals
GND
L303
VR302
TP305
VR301
L301
L309
TP302
TP301
L311
L302
L313
TP306
TP308
IC305
IC305
VR303
RV03
RV06
Do not turns
these VRs.
TP208
TP207
IC201
IC202
L103
TP01
TP205
(GND)
TP203
VR201
VR102
VR103
VR101
TP03
VR202
TP06
TP05
VR105
TP13
VR104
TP42
VR106
VR111
VR107
VR110
VR108
VR112
VR109

Fig. 7-1


FOCUS VR
B
G
R
Focus variable resistor (VR1)
B
G
R
SCREEN VR
SURROUND assembly
BUILT – IN SURROUND PROCESSOR switch (S451)
SURROUND BALANCE volume (VR451)
TP DOLBY LEVEL ADJ
VR452
GND
DEFLECTION assembly
TP402
VR553
VR554
TP410
VR551
VR552
VR558
TP422
VR557
TP421
TP420
*1
VR555
*2
VR556
FBT

Note : Do not turns VR555 (*1) and VR556 (*2)

Fig. 7-1 Adjustment point (1)

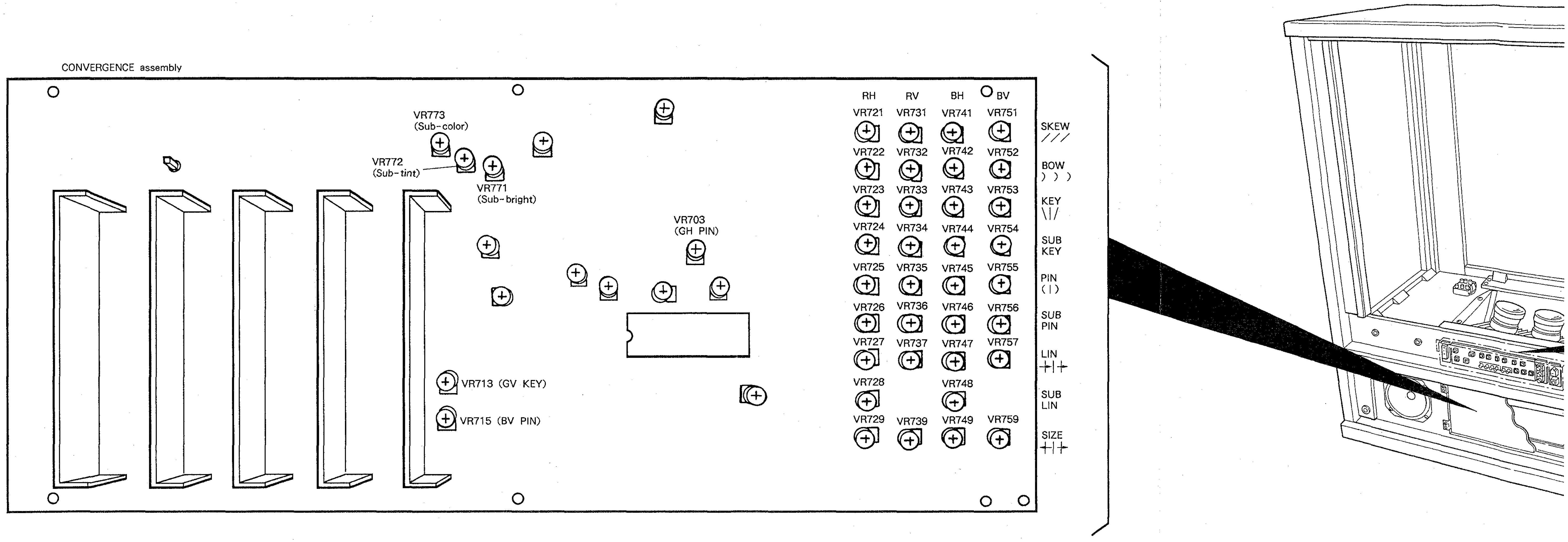

CONVERGENCE assembly
VR773
(Sub-color)
VR772
(Sub-tint)
VR771
(Sub-bright)
VR703
(GH PIN)
VR713 (GV KEY)
VR715 (BV PIN)
RH
RV
BH
BV
VR721
VR731
VR741
VR751
SKEW
///
VR722
VR732
VR742
VR752
BOW
)))
VR723
VR733
VR743
VR753
KEY
\|/
VR724
VR734
VR744
VR754
SUB
KEY
VR725
VR735
VR745
VR755
PIN
(|)
VR726
VR736
VR746
VR756
SUB
PIN
VR727
VR737
VR747
VR757
LIN
+|+
VR728
VR748
SUB
LIN
VR729
VR739
VR749
VR759
SIZE
+|+

Fig. 7-2

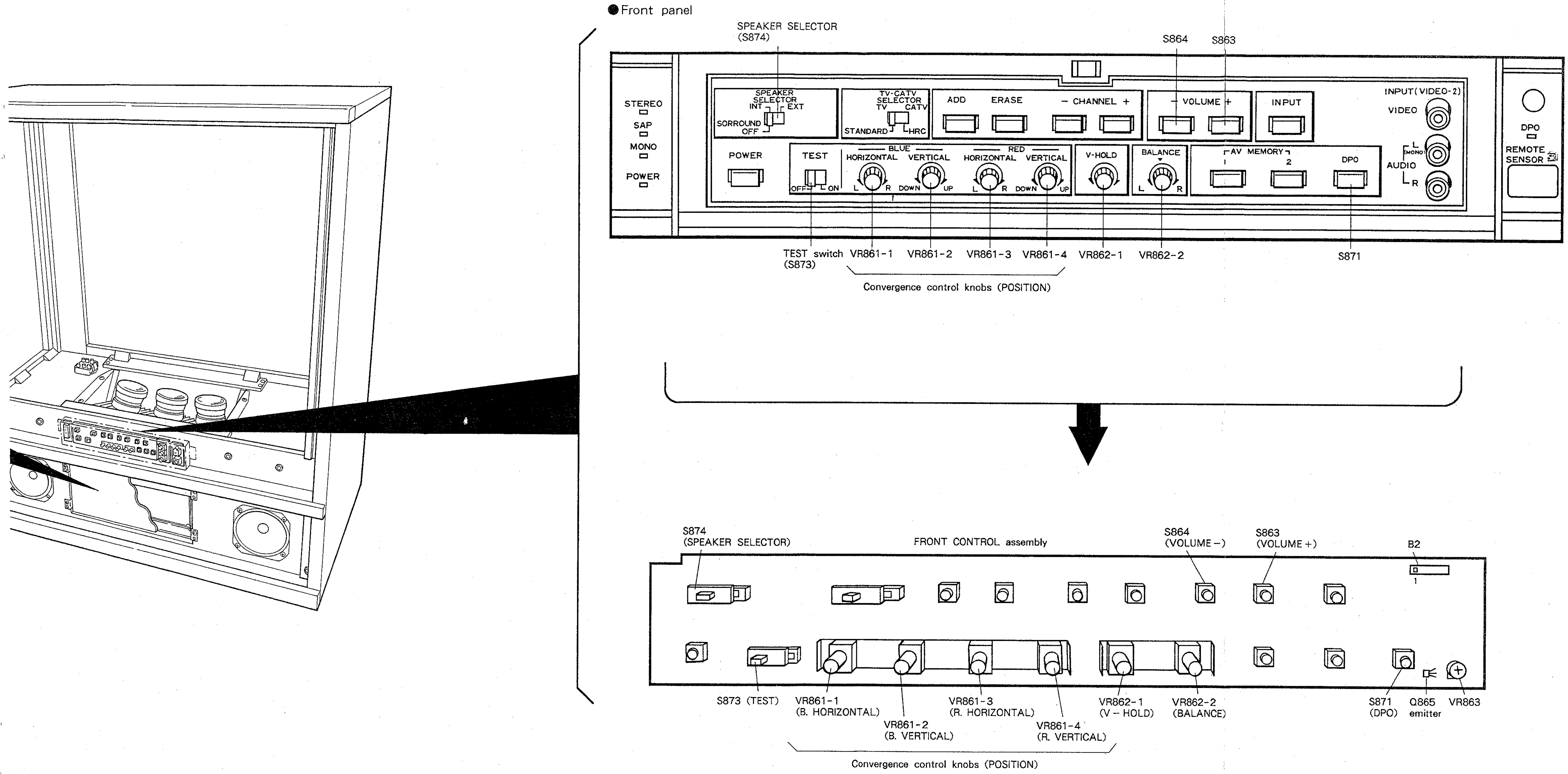

● Front panel
SPEAKER SELECTOR
(S874)
S864
S863
STEREO
SAP
MONO
POWER
SPEAKER SELECTOR
INT
EXT
SORROUND OFF
TV-CATV SELECTOR
TV
CATV
STANDARD
HRC
ADD
ERASE
– CHANNEL +
– VOLUME +
INPUT
INPUT(VIDEO-2)
VIDEO
L (MONO)
AUDIO
R
DPO
REMOTE SENSOR
POWER
TEST
OFF
ON
BLUE
HORIZONTAL
VERTICAL
RED
HORIZONTAL
VERTICAL
L
R
DOWN
UP
V-HOLD
BALANCE
AV MEMORY
1
2
DPO
TEST switch
(S873)
VR861-1
VR861-2
VR861-3
VR861-4
VR862-1
VR862-2
S871
Convergence control knobs (POSITION)
S874
(SPEAKER SELECTOR)
FRONT CONTROL assembly
S864
(VOLUME –)
S863
(VOLUME +)
B2
1
S873 (TEST)
VR861-1
(B. HORIZONTAL)
VR861-2
(B. VERTICAL)
VR861-3
(R. HORIZONTAL)
VR861-4
(R. VERTICAL)
VR862-1
(V – HOLD)
VR862-2
(BALANCE)
S871
(DPO)
Q865
emitter
VR863
Convergence control knobs (POSITION)

Fig. 7-2 Adjustment point (2)

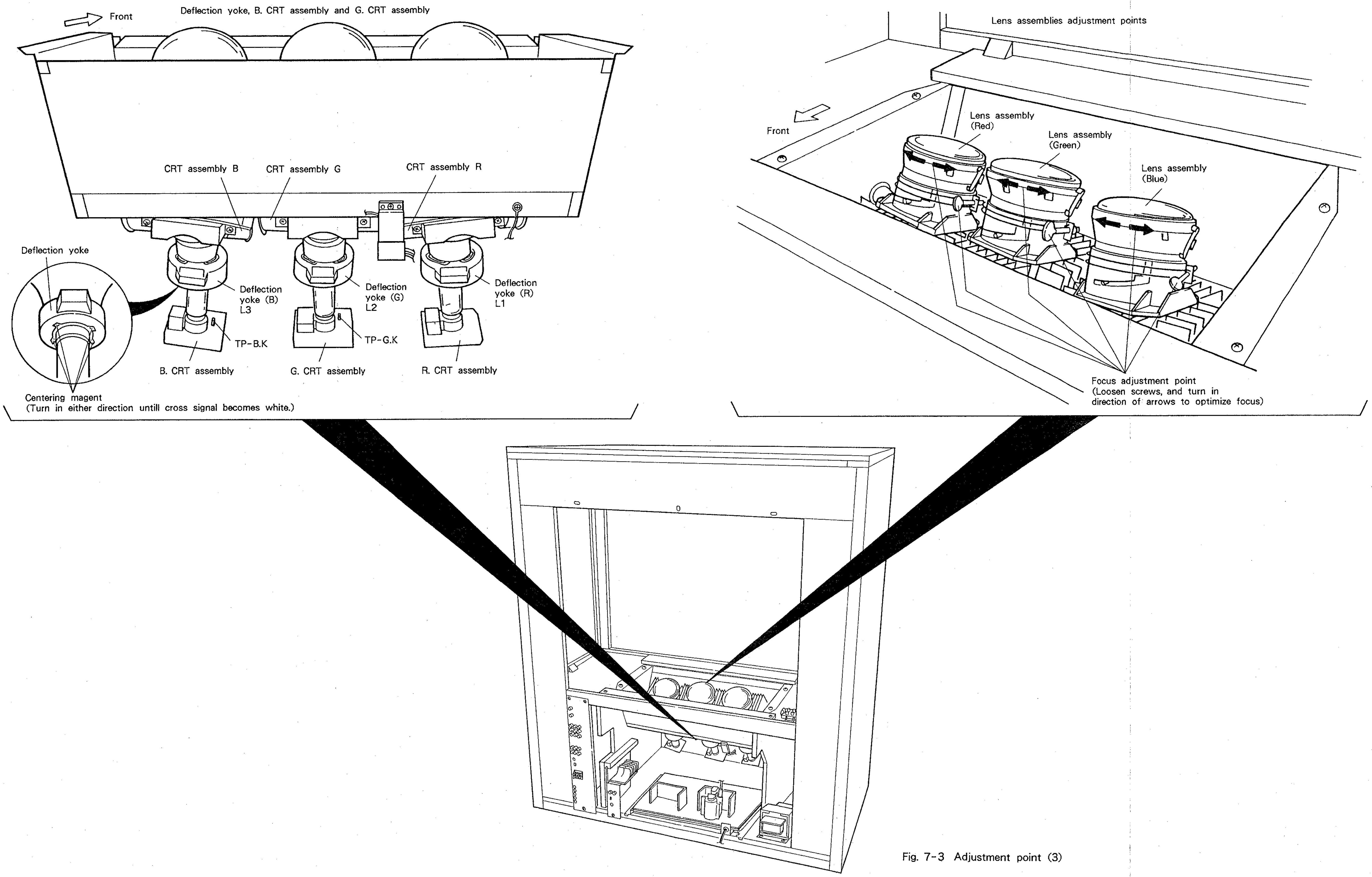
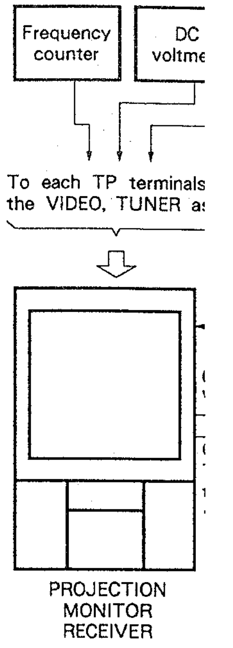
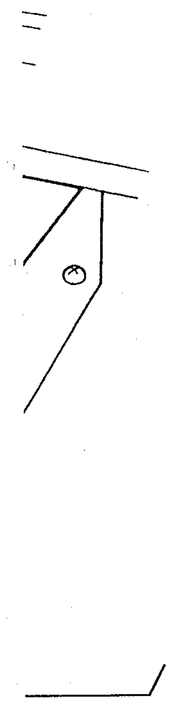

Front
Deflection yoke, B. CRT assembly and G. CRT assembly
CRT assembly B
CRT assembly G
CRT assembly R
Deflection yoke
Deflection yoke (B) L3
Deflection yoke (G) L2
Deflection yoke (R) L1
TP-B.K
TP-G.K
B. CRT assembly
G. CRT assembly
R. CRT assembly
Centering magent
(Turn in either direction untill cross signal becomes white.)
Lens assemblies adjustment points
Front
Lens assembly (Red)
Lens assembly (Green)
Lens assembly (Blue)
Focus adjustment point
(Loosen screws, and turn in direction of arrows to optimize focus)

Fig. 7-3 Adjustment point (3)


Frequency counter
DC voltme
To each TP terminals the VIDEO, TUNER a
PROJECTION MONITOR RECEIVER



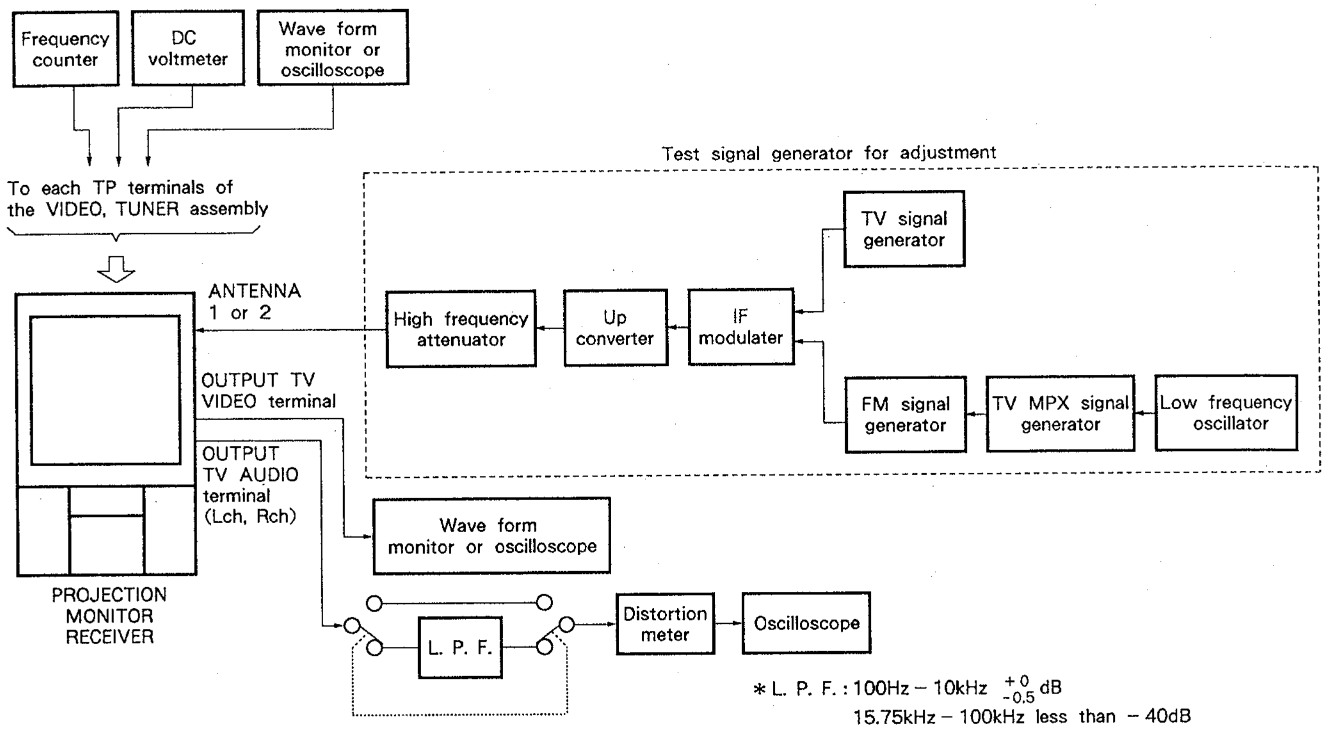

Frequency counter
DC voltmeter
Wave form monitor or oscilloscope
To each TP terminals of the VIDEO, TUNER assembly
Test signal generator for adjustment
ANTENNA 1 or 2
OUTPUT TV VIDEO terminal
OUTPUT TV AUDIO terminal (Lch, Rch)
PROJECTION MONITOR RECEIVER
TV signal generator
High frequency attenuator
Up converter
IF modulater
FM signal generator
TV MPX signal generator
Low frequency oscillator
Wave form monitor or oscilloscope
L. P. F.
Distortion meter
Oscilloscope
* L. P. F. : 100Hz – 10kHz $^{+0}_{-0.5}$ dB
15.75kHz – 100kHz less than – 40dB

Fig. 7-4 Connection diagram when adjusting the tuner section

7.15 ANODE VOLTAGE – MEASURING METHOD

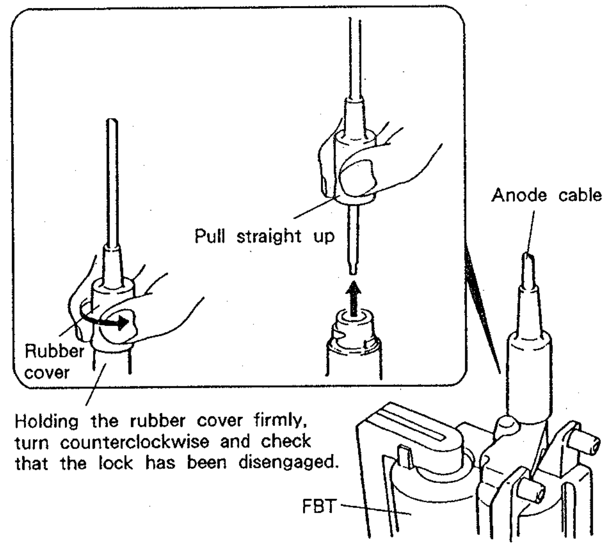
7.15.1 Anode cable connection and disconnection

Disconnect the FBT anode cable as outlined in Fig. 7-5. Confirm the extension of the rubber cover before disconnecting the cable, then it is easy to connect the anode cable after the anode voltage is measured. When connecting the anode cable, proceed in the reverse order as mentioned above. Confirm that the cable will not come off by pulling it after the cable is connected.

7.15.2 Anode–voltage measuring method

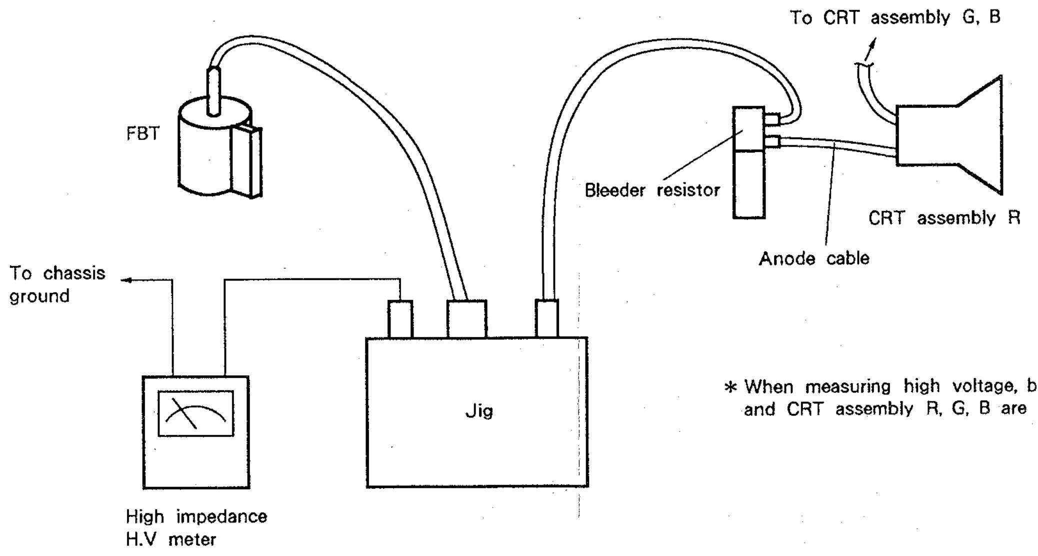
When measuring the anode voltage, measure by connecting the jig as shown in Fig. 7-6 after the anode cable is disconnected in section 7.15.1.

Note : Take extra precaution when measuring this high voltage. High voltage is also present in surrounding circuit boards (DEFLECTION assembly, R. G. B. CRT assembly etc ···).


Anode cable
Pull straight up
Rubber cover
FBT

Holding the rubber cover firmly, turn counterclockwise and check that the lock has been disengaged.

Fig. 7-5 Disconnecting the anode cable


To CRT assembly G, B
FBT
Bleeder resistor
CRT assembly R
Anode cable
To chassis ground
Jig
High impedance H.V meter

* When measuring high voltage, bleeder resistor and CRT assembly R, G, B are connected completely.

Fig. 7-6 Connecting the jig

8. CONVERGENCE ADJUSTMENT

- Picture movement and adjustment points are summarized in Fig. 8-1 and 8-2.
- Adjustment points are located in the CONVERGENCE assembly except POSITION control. Also adjustment points of POSITION are located in the FRONT CONTROL assembly. (Refer to Fig. 7-2)
- Input signal is the cross-hatch signal.
- Convergence adjustment outline and method of details are referred to the Service manual SD-P401 / KUX1C (ARP1455) . However, only V-LIN adjustment is referred to the service manual SD-P40/KU (ARP-977-0)
- After performed all adjustment, release the short-circuit to obtained white screen and perform the pre-adjustment.
- Correct the vertical line by horizontal correcting signal and correct the horizontal line by vertical correcting signal.
- Set the convergence control knob in front (POSITION VRs, VR861-1-4) to center position.

8.1 GREEN LINE ADJUSTMENT

- Since the green lines are used as a reference when adjusting red and blue, make sure it is adjusted accurately.
- Short-circuit TP-47R, TP-47B and GND in the VIDEO, TUNER assembly, then green lines appear in the screen. Release the short-circuit after green line adjustment.

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	GH – PIN	VR703	Adjust the green line to a straight line (refer to Fig. 8-1 and 8-2).
2	GV – KEY	VR713	
3	GV – PIN	VR715	
4	Repeat steps 1 thru 3 until the best possible picture is obtained.		

8.2 RED LINE ADJUSTMENT

- Short-circuit TP-47B and GND, then green lines and red lines appear in the screen. Release the short-circuit after red line adjustment.
- Adjust each VR so that the red lines converge with the green lines to obtain yellow lines.
- After adjustmet, perform fine-adjustment by observing the overall screen.

8.2.1 Red horizontal distortion compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RH-SKEW	VR721	Adjust the red vertical lines in the center of the screen to straight lines without distortion and lean. (Refer to Fig. 8-1.)
2	RH-BOW	VR722	
3	Repeat steps 1 and 2.		
4	RH-KEY	VR723	Adjust the red vertical lines in the right and left section of the screen to straight lines without lean. (Refer to Fig. 8-1.)
5	RH-S-KEY	VR724	
6	Repeat steps 4 and 5.		
7	RH-PIN	VR725	Adjust the red vertical lines in the right and left sections of the screen to straight lines without distortion. (Refer to Fig. 8-1 and 8-2.)
8	RH-S-PIN	VR726	
9	Repeat steps 7 and 8 or steps 1 thru 8.		

8.2.2 Red horizontal interval compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RH-POSITION	VR861-3	Adjust so that the red vertical lines converge with the green vertical lines in the center of the screen to obtain yellow lines. (This serves as the reference setting, but if the lines diverge during the adjustment, proceed with the adjustment after considering this divergence.)
2	RH-LIN	VR727	Adjust so that the red vertical lines converge with the green vertical lines in the right and left sections of the screen to obtain yellow lines. (Refer to Fig. 8-2)
3	RH-S-LIN	VR728	
4	RH-SIZE	VR729	
5	Repeat steps 1 thru 4.		

8.2.3 Red vertical distortion compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RV-SKEW	VR731	Adjust the red horizontal lines in the center of the screen to straight lines without distortion and lean. (Refer to Fig. 8-1.)
2	RV-BOW	VR732	
3	Repeat steps 1 and 2.		
4	RV-KEY	VR733	Adjust the red horizontal lines in the lower and upper sections of the screen to straight lines without lean. (Refer to Fig. 8-1.)
5	RV-S-KEY	VR734	
6	RV-PIN	VR735	
7	RV-S-PIN	VR736	When the red horizontal lines in the lower and upper sections of the screen are bent by the wave-form, adjust as in Fig. 8-1 and 8-2. After adjustment, adjust RV-KEY, RV-S-KEY and RV-PIN again.
8	Repeat steps 4 thru 7 or steps 1 thru 7.		

8.2.4 Red vertical interval compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RV-LIN	VR737	Adjust so that the red horizontal lines converge the green horizontal lines in the center of the screen to obtain yellow lines. (This serves as the reference setting, but if the lines diverge during the adjustment, proceed with the adjustment after considering this divergence.) (Refer to Fig. 8-2.)
2	RV-POSITION	VR861-4	
3	RV – SIZE	VR739	Adjust so that the red horizontal lines converge the green horizontal lines in the lower and upper sections of the screen to obtain yellow lines. (Refer to Fig. 8-2.)
4	Repeat steps 1 thru 3.		

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8.2 RED LINE ADJUSTMENT

- Short-circuit TP-47B and GND, then green lines and red lines appear in the screen. Release the short-circuit after red line adjustment.
- Adjust each VR so that the red lines converge with the green lines to obtain yellow lines.
- After adjustmet, perform fine-adjustment by observing the overall screen.

8.2.1 Red horizontal distortion compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RH-SKEW	VR721	Adjust the red vertical lines in the center of the screen to straight lines without distortion and lean. (Refer to Fig. 8-1.)
2	RH-BOW	VR722	
3	Repeat steps 1 and 2.		
4	RH-KEY	VR723	Adjust the red vertical lines in the right and left section of the screen to straight lines without lean. (Refer to Fig. 8-1.)
5	RH-S-KEY	VR724	
6	Repeat steps 4 and 5.		
7	RH-PIN	VR725	Adjust the red vertical lines in the right and left sections of the screen to straight lines without distortion. (Refer to Fig. 8-1 and 8-2.)
8	RH-S-PIN	VR726	
9	Repeat steps 7 and 8 or steps 1 thru 8.		

8.2.2 Red horizontal interval compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RH-POSITION	VR861-3	Adjust so that the red vertical lines converge with the green vertical lines in the center of the screen to obtain yellow lines. (This serves as the reference setting, but if the lines diverge during the adjustment, proceed with the adjustment after considering this divergence.)
2	RH-LIN	VR727	Adjust so that the red vertical lines converge with the green vertical lines in the right and left sections of the screen to obtain yellow lines. (Refer to Fig. 8-2)
3	RH-S-LIN	VR728	
4	RH-SIZE	VR729	
5	Repeat steps 1 thru 4.		

8.2.3 Red vertical distortion compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RV-SKEW	VR731	Adjust the red horizontal lines in the center of the screen to straight lines without distortion and lean. (Refer to Fig. 8-1.)
2	RV-BOW	VR732	
3	Repeat steps 1 and 2.		
4	RV-KEY	VR733	Adjust the red horizontal lines in the lower and upper sections of the screen to straight lines without lean. (Refer to Fig. 8-1.)
5	RV-S-KEY	VR734	
6	RV-PIN	VR735	
7	RV-S-PIN	VR736	When the red horizontal lines in the lower and upper sections of the screen are bent by the wave-form, adjust as in Fig. 8-1 and 8-2. After adjustment, adjust RV-KEY, RV-S-KEY and RV-PIN again.
8	Repeat steps 4 thru 7 or steps 1 thru 7.		

8.2.4 Red vertical interval compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	RV-LIN	VR737	Adjust so that the red horizontal lines converge the green horizontal lines in the center of the screen to obtain yellow lines. (This serves as the reference setting, but if the lines diverge during the adjustment, proceed with the adjustment after considering this divergence.) (Refer to Fig. 8-2.)
2	RV-POSITION	VR861-4	
3	RV – SIZE	VR739	Adjust so that the red horizontal lines converge the green horizontal lines in the lower and upper sections of the screen to obtain yellow lines. (Refer to Fig. 8-2.)
4	Repeat steps 1 thru 3.		

8.3 BLUE LINE ADJUSTMENT

- Short-circuit TP-47R and GND, then green lines and blue lines appear in the screen. Release the short-circuit after blue line adjustment.
- Adjust each VR so that the red lines converge with the green lines to obtain magenta lines.
- After adjustment, perform fine-adjustment by observing the overall screen.

8.3.1 Blue horizontal distortion compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	BH-SKEW	VR741	Observe the blue vertical lines in the screen, and adjust in the same way as the red horizontal distortion compensation adjustment.
2	BH-BOW	VR742	
3	BH-KEY	VR743	
4	BH-S-KEY	VR744	
5	BH-PIN	VR745	
6	BH-S-PIN	VR746	

8.3.2 Blue horizontal interval compensation adjustment

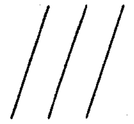
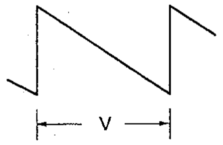
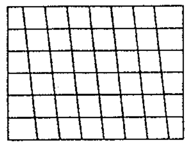
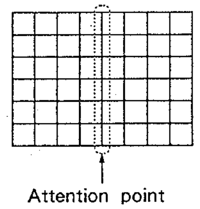
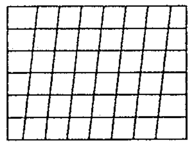
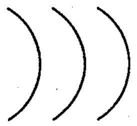
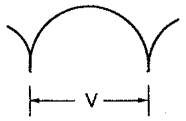
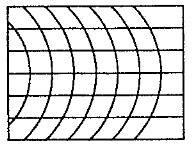
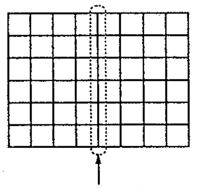
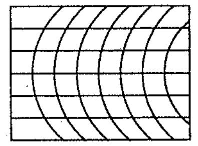
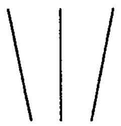
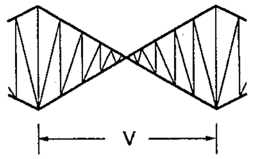
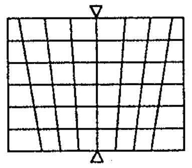
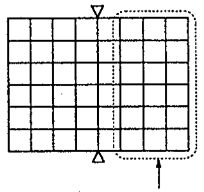
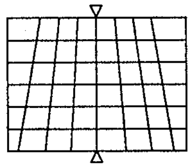
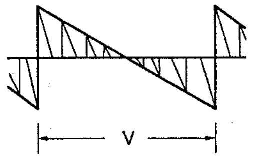
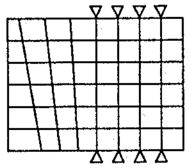
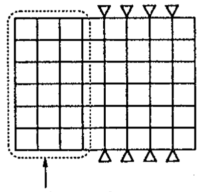
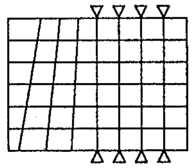
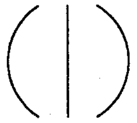
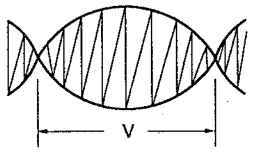
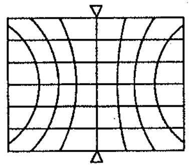
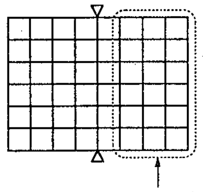
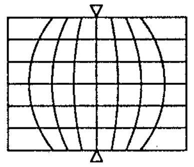
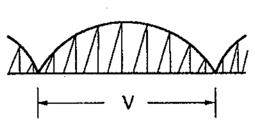
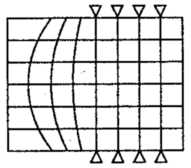
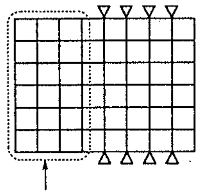
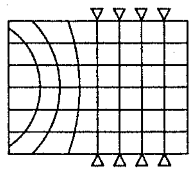
Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	B-H-POSITION	VR861-1	Adjust so that the blue lines converge with the green lines to obtain magenta lines in the same way as the red horizontal interval compensation adjustment. However, BH-S-LIN movements are reversed on the left and right sides of RH-S-LINE. The main points of BH-LIN and BH-S-LIN are reversed on the left and right sides of RH-LIN and RH-S-LIN.
2	BH-LIN	VR747	
3	BH-S-LIN	VR748	
4	BH-SIZE	VR749	

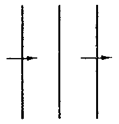
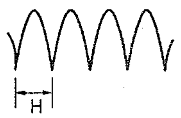
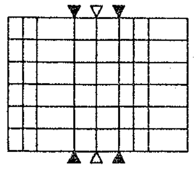
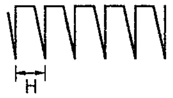
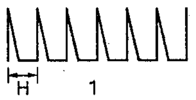
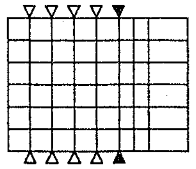
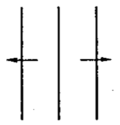
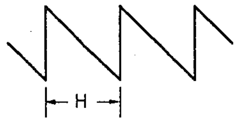
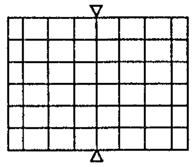
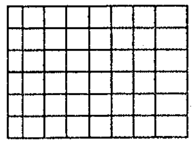
8.3.3 Blue vertical distortion compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	BV-SKEW	VR751	Observe the blue horizontal lines in the screen, and adjust in the same way as the red vertical distortion compensation adjustment.
2	BV-BOW	VR752	
3	BV-KEY	VR753	
4	BV-S-KEY	VR754	
5	BV-PIN	VR755	
6	BV-S-PIN	VR756	

8.3.4 Blue vertical interval compensation adjustment

Step No.	Adjustment item	Adjustment point	Adjustment procedure
1	BV-LIN	VR757	Adjust so that the blue lines converge with the green lines to obtain magenta lines in the same way as the red vertical interval compensation adjustment.
2	BV-POSITION	VR861-2	
3	BV-SIZE	VR759	

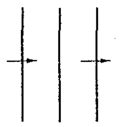
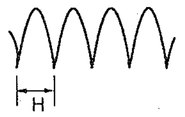
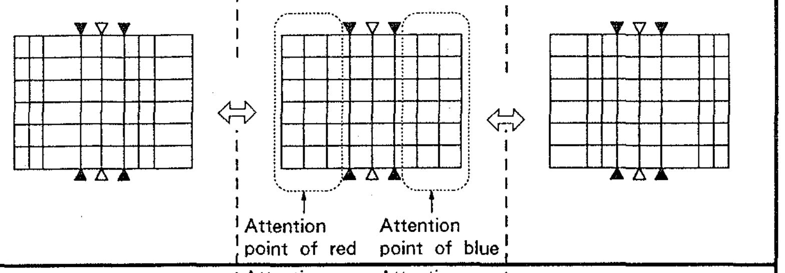
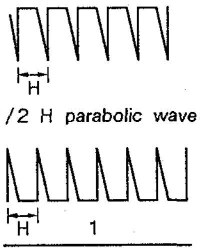
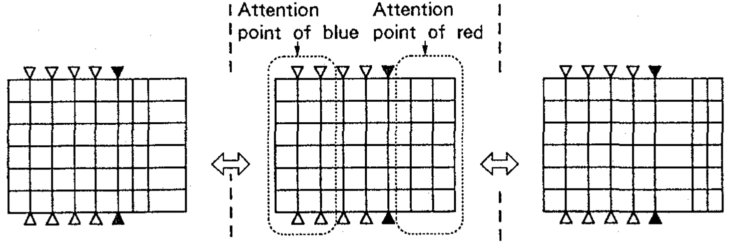
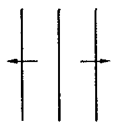
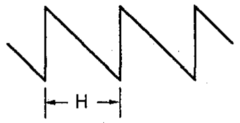
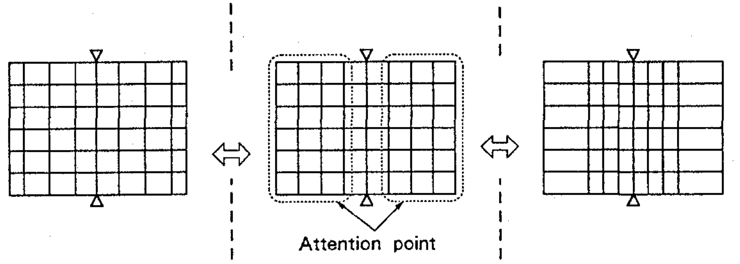
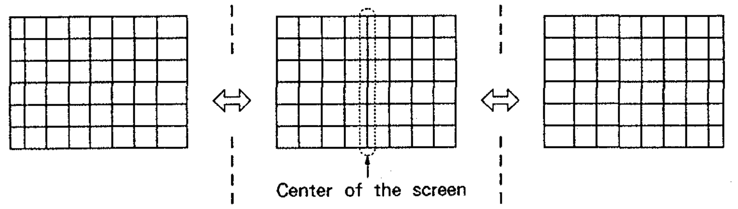
Compensation	Signal and mark ＊1	Compensating signal	Distorted screen	Corrected screen	Distorted screen	Adjustment point	
Horizontal distortion compensation	H-SKEW 	 V sawtooth wave		⇔  ⇔ Attention point		Observe the vertical lines in the center of the screen (where there is no H-KEY, H-S-KEY, H-PIN nor H-S-PIN movement), then adjust the vertical lines to eliminate lean.	To obtain the best possible lines, adjust the vertical lines in the center of the screen following the adjustment procedure of H-SKEW and H-BOW.
	H-BOW 	 V parabolic wave		⇔  ⇔ Attention point		Observe the vertical lines in the center of the screen, then adjust the bowed lines to straight lines.	
	H-KEY 	 V sawtooth wave × H sawtooth wave		⇔  ⇔ Attention point		Observe the vertical lines in the right section of the screen (where there is no H-S-KEY nor H-S-PIN movement), then adjust the vertical lines to eliminate lean.	To eliminate lean, adjust the vertical lines in the right and left sections of the screen following the adjustment procedure of H-KEY and H-S-KEY.
	H-S-KEY	 V sawtooth wave × 1/2 H sawtooth wave		⇔  ⇔ Attention point		Observe the vertical lines in the left section of the screen, then adjust the vertical lines to eliminate lean.	
	H-PIN 	 V parabolic wave × H sawtooth wave		⇔  ⇔ Attention point		Observe the vertical lines in the right section of the screen, then adjust the bowed lines to straight lines.	To eliminate distortion, straighten the vertical lines in the right and left sections of the screen following the adjustment procedure of H-PIN and H-S-PIN.
	H-S-PIN	 V parabolic wave × 1/2 H sawtooth wave		⇔  ⇔ Attention point		Observe the vertical lines in the left section of the screen, then adjust the bowed lines to straight lines.	

Compensation	Signal and mark ＊1	Compensating signal	Distorted screen	
Horizontal interval compensation	H-LIN 	 H parabolic wave		⇔ At po
	H-S-LIN	 1/2 H parabolic wave  1/2 H parabolic wave	 Note : Movement Left and r	At po ⇔
	H-SIZE 	 H sawtooth wave		⇔
	H-POSITION	DC voltage		⇔

Note : KEY is short for KEYSTC
and LIN for LINEARITY
▽ : denotes points which
▼ : denotes points which
＊1 : Sketch is printed on the

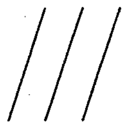
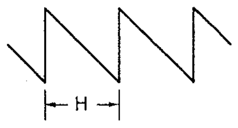
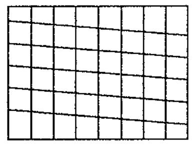
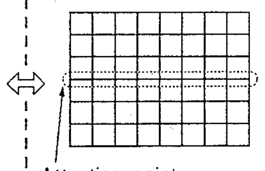
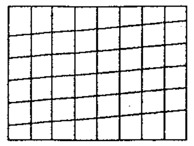
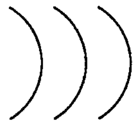
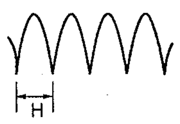
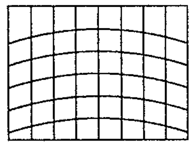
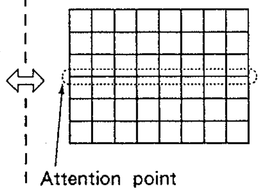
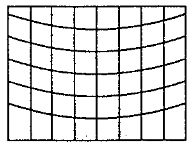
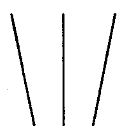
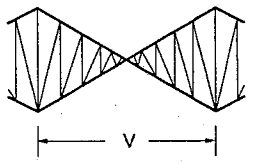
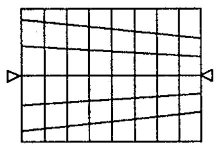
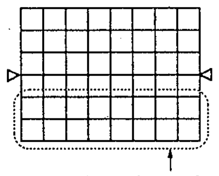
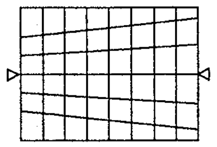
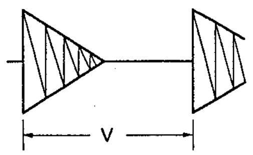
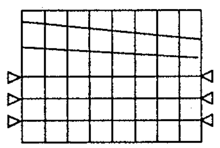
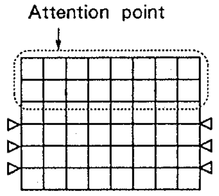
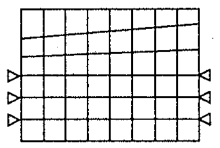
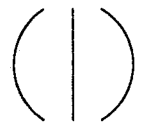
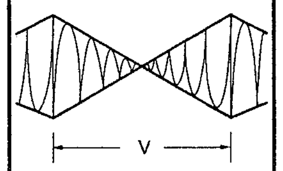
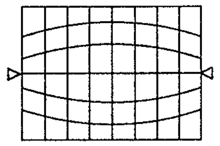
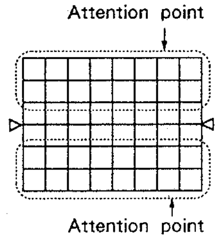
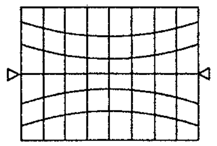
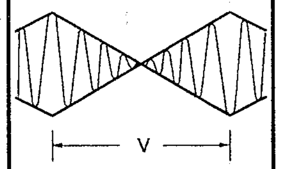
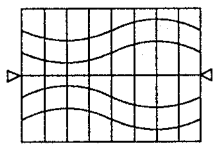
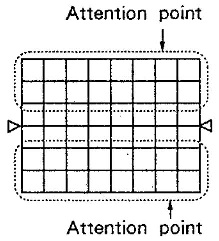
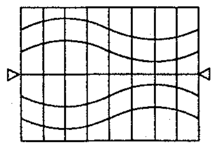
Fig. 8-1 Horizontal compensation

Adjustment point	
Observe the vertical lines in the center of the screen (where there is no H－KEY, H－S－KEY, H－PIN nor H－S－PIN movement), then adjust the vertical lines to eliminate lean.	To obtain the best possible lines, adjust the vertical lines in the center of the screen following the adjustment procedure of H－SKEW and H－BOW.
Observe the vertical lines in the center of the screen, then adjust the bowed lines to straight lines.	
Observe the vertical lines in the right section of the screen (where there is no H－S－KEY nor H－S－PIN movement), then adjust the vertical lines to eliminate lean.	To eliminate lean, adjust the vertical lines in the right and left sections of the screen following the adjustment procedure of H－KEY and H－S－KEY.
Observe the vertical lines in the left section of the screen, then adjust the vertical lines to eliminate lean.	
Observe the vertical lines in the right section of the screen, then adjust the bowed lines to straight lines.	To eliminate distortion, straighten the vertical lines in the right and left sections of the screen following the adjustment procedure of H－PIN and H－S－PIN.
Observe the vertical lines in the left section of the screen, then adjust the bowed lines to straight lines.	

Compensation	Signal and mark ＊1	Compensating signal	Distorted screen	Corrected screen	Distorted screen	Adjustment point	
Horizontal interval compensation	H－LIN 	 H parabolic wave				Adjust following the adjustment procedure of H－LIN and H－S－LIN (remember the degree of H－SIZE movement) so that the interval between vertical lines on the right section is the same as on the left section, with a central point which does not move. For example, when the vertical lines in the right section of the screen are moved to right direction, move the vertical lines in the left section of the screen as same degree as the gap in the right section to the left direction. H－S－LIN movement of red and blue are reversed from right to left, therefore the attention point of H－LIN and H－S－LIN are reversed from right to left.	The vertical lines in the center of the screen converge into the green lines by H－POSITION. And also, the vertical lines in the right and left sections of the screen converge into the green lines by H－LIN, H－S－LIN and H－SIZE.
	H－S－LIN	 1/2 H parabolic wave 1/2 H parabolic wave	 Note : Movement shown here is for red lines. Left and right are reversed for blue line movement.				
	H－SIZE 	 H sawtooth wave				Converge the vertical lines in the right and left sections of the screen to green lines.	
	H－POSITION	DC voltage				The vertical lines of the screen move parallel on the right and left by the convergence control knob of the front. When the vertical line moves at will, consider the degree of movement.	

Note : KEY is short for KEYSTONE,
and LIN for LINEARITY
▽ : denotes points which do not move
▼ : denotes points which hardly move
＊1 : Sketch is printed on the p.c. board.

Fig. 8-1 Horizontal compensation

Compensation	Signal and mark *1	Compensating signal	Distorted screen	Corrected screen	Distorted screen	Adjustment point	
Vertical distortion compensation	V－SKEW 	 H sawtooth wave				Observe the horizontal lines in the center of the screen (where there is no V－KEY, V－S－KEY, V－PIN nor V－S－PIN movement), then adjust the horizontal lines to eliminate lean.	To obtain the best possible lines, adjust the horizontal lines in the center of the screen following the adjustment procedure of V－SKEW and V－BOW.
	V－BOW 	 H parabolic wave				Observe the horizontal lines in the center of the screen, then adjust the bowed lines to straight lines.	
	V－KEY 	 V sawtooth wave × H sawtooth wave				Observe the horizontal lines in the lower section of the screen (where there is no V－S－KEY movement), then adjust the horizontal lines to eliminate lean.	To eliminate lean, adjust the horizontal lines in the upper and lower sections of the screen following the adjustment procedure of V－KEY and V－S－KEY.
	V－S－KEY	 1/2 V sawtooth wave × H sawtooth wave				Observe the horizontal lines in the upper section of the screen, then adjust the horizontal lines to eliminate lean.	
	V－PIN 	 V sawtooth wave × H parabolic wave				Observe the horizontal lines in the upper and lower sections of the screen, then adjust the bowed lines to straight lines.	To eliminate distortion, straighten the horizontal lines in the upper and lower sections of the screen following the adjustment procedure of V－PIN and V－S－PIN.
	V－S－PIN	 V sawtooth wave × H sine wave				Observe the horizontal lines in the upper and lower sections of the screen, then adjust the waved lines to nearly straight lines. (Support of V－KEY and V－PIN.) After adjustment, adjust V－KEY, V－PIN and V－S－KEY again.	

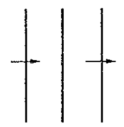
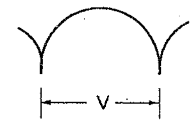
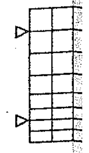
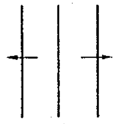
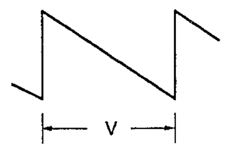
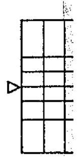
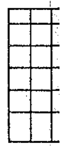
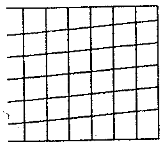
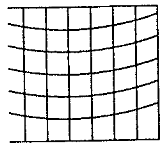
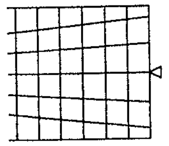
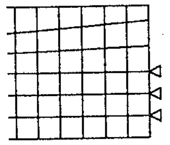
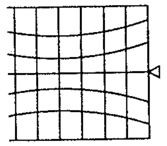
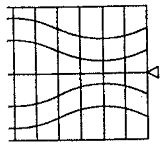
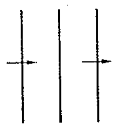
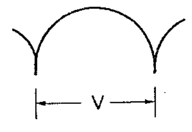
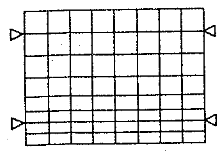
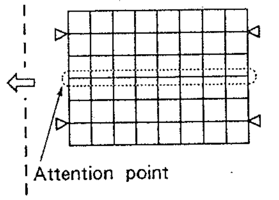
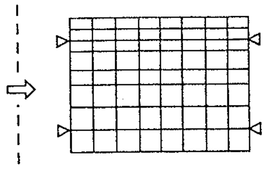
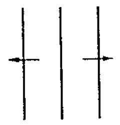
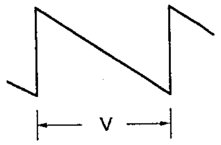
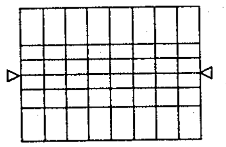
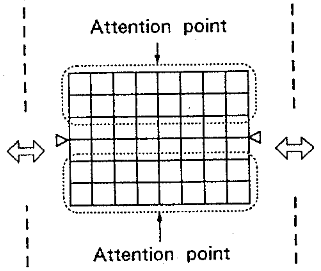
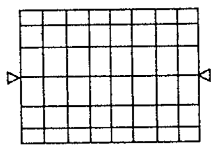
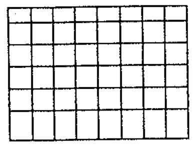
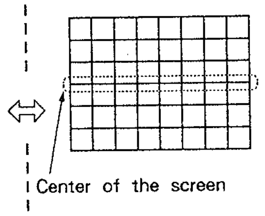
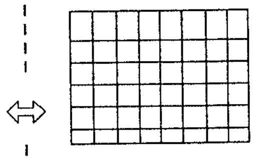
Compensation	Signal and mark *1	Compensating signal	Disto
Vertical interval compensation	*2 V－LIN 	 V parabolic wave	
	V－S－LIN		
	V－SIZE 	 V sawtooth wave	
	V－POSITION	DC voltage	

Fig. 8-2 Vertical compensation

torted screen	Adjustment point	
	Observe the horizontal lines in the center of the screen (where there is no V-KEY, V-S-KEY, V-PIN nor V-S-PIN movement), then adjust the horizontal lines to eliminate lean.	To obtain the best possible lines, adjust the horizontal lines in the center of the screen following the adjustment procedure of V-SKEW and V-BOW.
	Observe the horizontal lines in the center of the screen, then adjust the bowed lines to straight lines.	
	Observe the horizontal lines in the lower section of the screen (where there is no V-S-KEY movement), then adjust the horizontal lines to eliminate lean.	To eliminate lean, adjust the horizontal lines in the upper and lower sections of the screen following the adjustment procedure of V-KEY and V-S-KEY.
	Observe the horizontal lines in the upper section of the screen, then adjust the horizontal lines to eliminate lean.	
	Observe the horizontal lines in the upper and lower sections of the screen, then adjust the bowed lines to straight lines.	To eliminate distortion, straighten the horizontal lines in the upper and lower sections of the screen following the adjustment procedure of V-PIN and V-S-PIN.
	Observe the horizontal lines in the upper and lower sections of the screen, then adjust the waved lines to nearly straight lines. (Support of V-KEY and V-PIN.) After adjustment, adjust V-KEY, V-PIN and V-S-KEY again.	

Compensation	Signal and mark *1	Compensating signal	Distorted screen	Corrected screen	Distorted screen	Adjustment point	
Vertical interval compensation	*2 V-LIN 	 V parabolic wave				Converge the horizontal lines in the center of the screen into green lines. At this time, be sure to the same horizontal line interval as upper section as lower section about a central point. However, if the same interval is not to obtained, adjust POSITION and adjust V-LIN again.	The horizontal lines in the center of the screen converge into the green line by V-LIN and V-POSITION. And also the horizontal lines in the upper and lower sections of the screen converge into the green line by V-SIZE.
	V-S-LIN	No adjustment				–	
	V-SIZE 	 V sawtooth wave				Converge the horizontal lines in the upper and lower sections of the screen into green lines.	
	V-POSITION	DC voltage				The horizontal lines of the screen move parallel on the upper and lower by the convergence control knob at the front. When the horizontal line moves at will, consider the degree of movement.	

Note : KEY is short for KEYSTONE, and LIN for LINEARITY.
▽ : denotes points which do not move.
*1 : Sketch is printed on the P.C. board.
*2 : The movement of V-LIN is the same as the SD-P40/KU.

Fig. 8-2 Vertical compensation

9. REPLACING THE CRT ASSEMBLY AND THE BLEEDER RESISTOR

The anode cables of the CRT assembly R, G, and B in PROJECTION MONITOR RECEIVER are connected in series as shown in Fig. 9-1. Also the bleeder resistor is connected between the CRT assembly R and the FBT.

Then, when replacing the CRT assembly, the anode cable have to be cut, and when replacing the bleeder resistor, the cable have to be cut or disconnected from the FBT.

Note : Since the anode cables for the CRT assembly and the anode cable kit to service supplies are only available in half lengths, either cut longer lengths, or join older lengths of cable to ensure that the original cable length is used.

9.1 WHEN REPLACING THE CRT ASSEMBLY

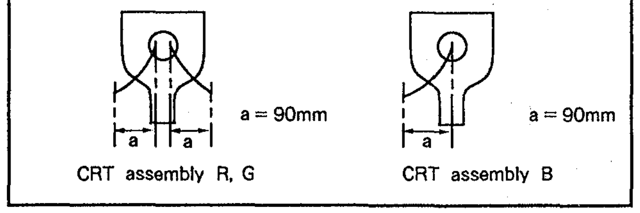
Disconnect the power plug from power mains. Then wait at least one minute (for discharge), cut the cables as shown in Table 9-1.

Table 9-1 Cable disconnecting methods

Cable	Replacement CRT assembly		
	When CRT assembly R is replaced	When CRT assembly G is replaced	When CRT assembly B is replaced
Cable ⓐ	Cut a place 70mm from the CRT assembly R.	Leave as is	Leave as is
Cable ⓑ	Cut a place 20mm from the exact center towards the CRT assembly R	Cut a place 20mm from the exact center towards the CRT assembly G	Leave as is
Cable ⓒ	Leave as is	Cut a place 20mm from the exact center towards the CRT assembly G	Cut a place 20mm from the exact center towards the CRT assembly B

Note : Do not cut other cables by mistake.

Each CRT assembly supplied as a spare part is as shown below.


a = 90mm
a
a
CRT assembly R, G
a = 90mm
a
CRT assembly B

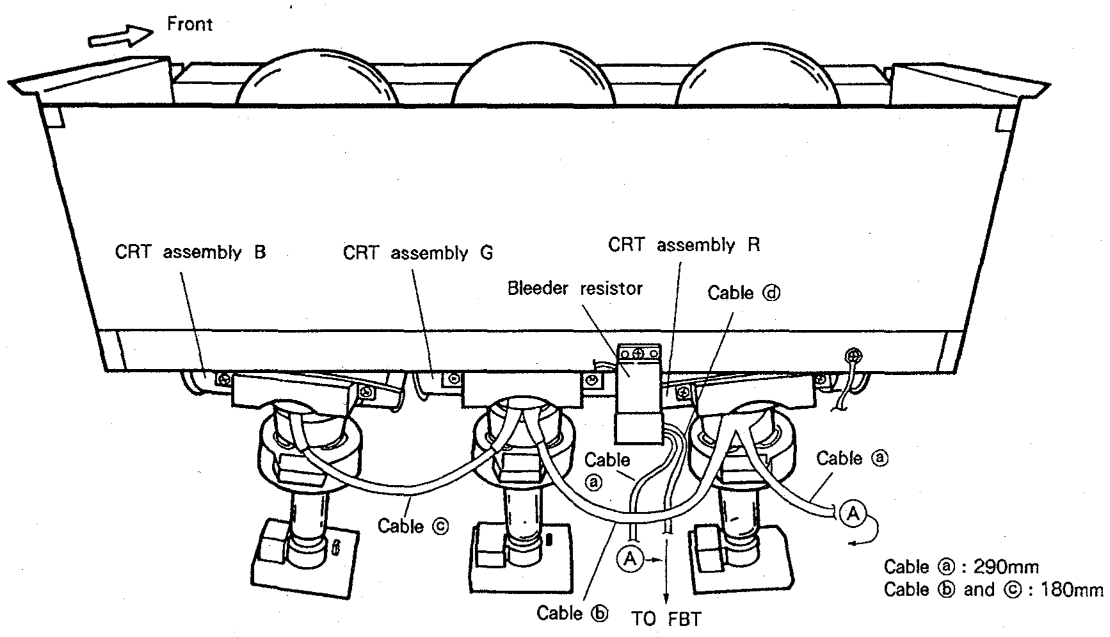
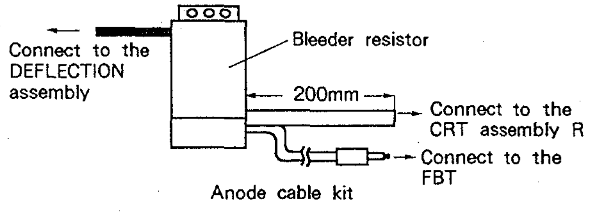

Front
CRT assembly B
CRT assembly G
CRT assembly R
Bleeder resistor
Cable ⓓ
Cable ⓐ
Cable ⓐ
Cable ⓒ
Ⓐ
Ⓐ
Cable ⓑ
TO FBT
Cable ⓐ : 290mm
Cable ⓑ and ⓒ : 180mm

Fig. 9-1 Connection diagram of the each CRT assemblies

9.2 WHEN REPLACING THE BLEEDER RESISTOR

The bleeder resistor, supplied as a spare part, comes as the anode cable kit (GXX1024) provided with an anode cable as shown below.


Connect to the DEFLECTION assembly
Bleeder resistor
200mm
Connect to the CRT assembly R
Connect to the FBT
Anode cable kit

When replacing the bleeder resistor, the anode cable structure is following sections.

1. Disconnect the power plug from power mains, then wait a least one minute (for discharge).
2. Disconnect cable ⓓ from the FBT as described in section 7.15.1 "Anode cable connection and disconnection."
3. Cut cable ⓐ a place 110mm from the CRT assembly R.

9.3 ANODE CABLE SHEATH PEELING

- Peel the sheath of the end of cut anode cable and new anode cable are as follows.
- The anode cable structure is outlined in Fig. 9-2. Note that the sheath consists of two layers.
- The method used to peel the sheath back is illustrated in Fig. 9-3. Use a cutter knife, taking care not to damage the core leads.

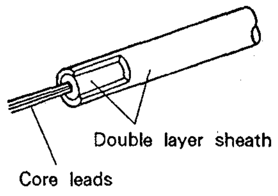

Double layer sheath
Core leads

Fig. 9-2 Anode cable structure

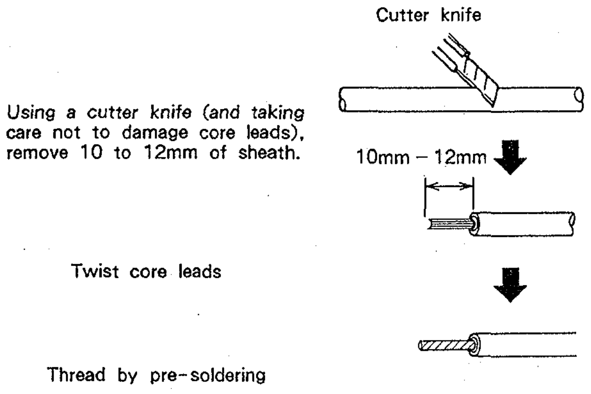

Cutter knife
Using a cutter knife (and taking care not to damage core leads), remove 10 to 12mm of sheath.
10mm – 12mm
Twist core leads
Thread by pre-soldering

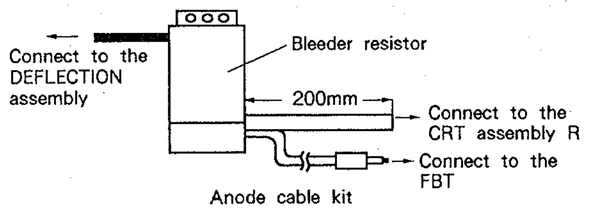
Fig. 9-3 Anode cable sheath peeling

9.4 ANODE CABLE JOINING PROCEDURE

- Join the cut anode cable and the new anode cable to restored as shown in Fig. 9-1. Also, when replacing the FBT, refer to section 7.15.1 "Anode cable connection and disconnection".
- Slip two silicon tubes (silicon tubes A and B in Fig. 9-4) onto the anode cables before making the join.
- Leave the silicon binder to harden overnight.
- The silicon binder is applied to guard the cable core leads from external air. Apply binder liberally. After completing the joint (at step ⑩ in Fig. 9-4 -1 thru 2), make a hole in the silicon binder and check that the tube interior cannot be seen.

9.2 WHEN REPLACING THE BLEEDER RESISTOR

The bleeder resistor, supplied as a spare part, comes as the anode cable kit (GXX1024) provided with an anode cable as shown below.


Connect to the DEFLECTION assembly
Bleeder resistor
200mm
Connect to the CRT assembly R
Connect to the FBT
Anode cable kit

When replacing the bleeder resistor, the anode cable structure is following sections.

1. Disconnect the power plug from power mains, then wait a least one minute (for discharge).
2. Disconnect cable ⓓ from the FBT as described in section 7.15.1 "Anode cable connection and disconnection."
3. Cut cable ⓐ a place 110mm from the CRT assembly R.

9.3 ANODE CABLE SHEATH PEELING

- Peel the sheath of the end of cut anode cable and new anode cable are as follows.
- The anode cable structure is outlined in Fig. 9-2. Note that the sheath consists of two layers.
- The method used to peel the sheath back is illustrated in Fig. 9-3. Use a cutter knife, taking care not to damage the core leads.

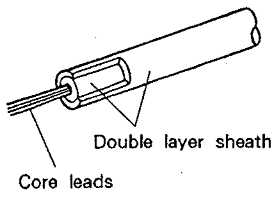
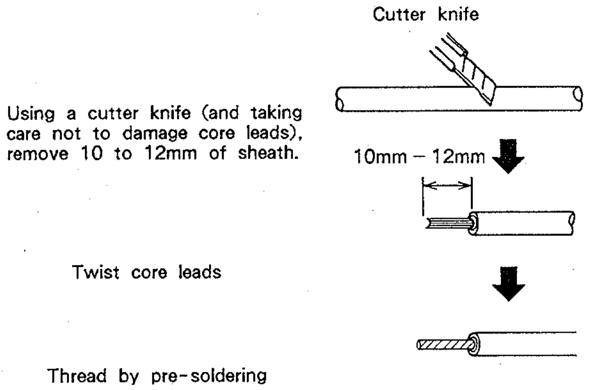

Double layer sheath
Core leads

Fig. 9-2 Anode cable structure

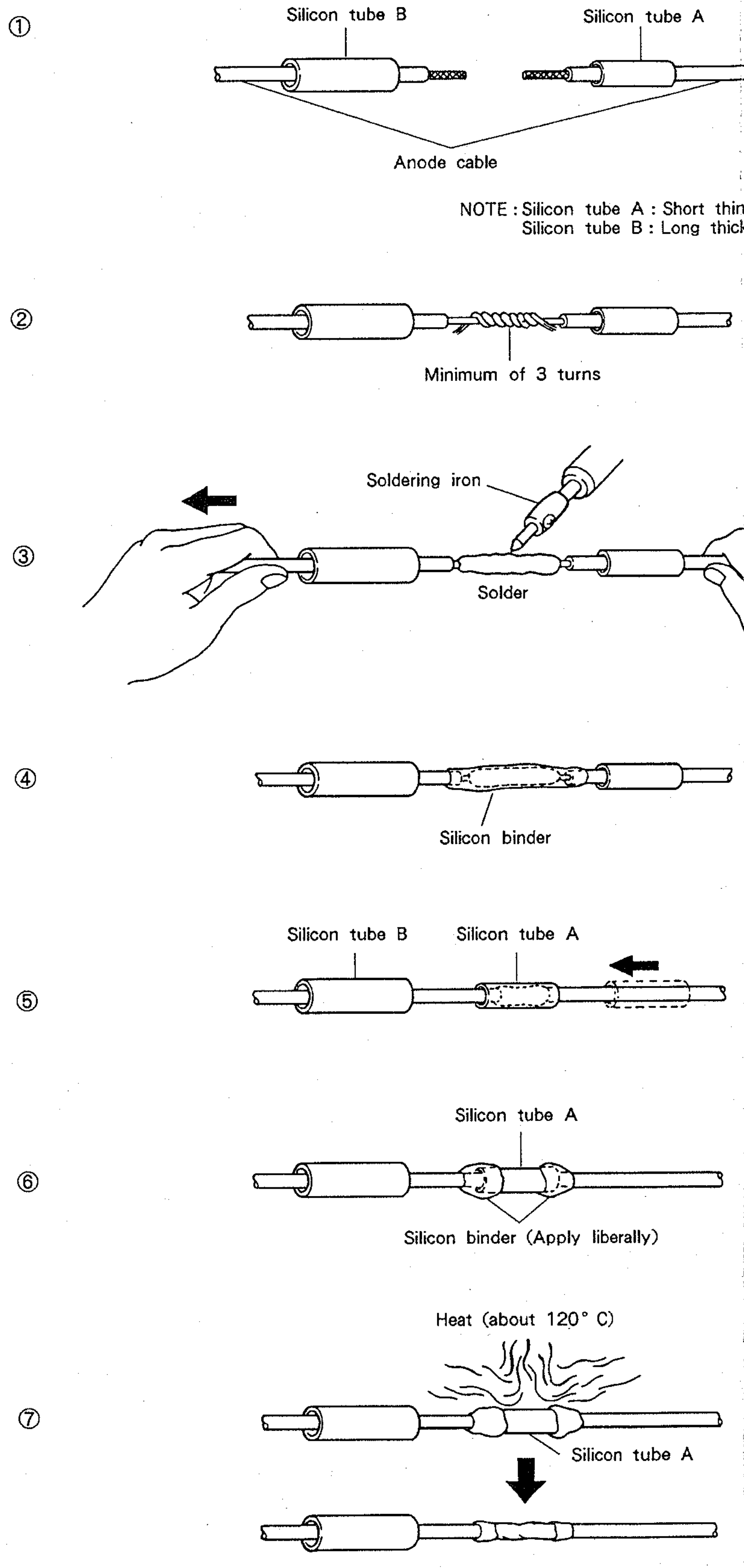

Cutter knife
10mm – 12mm
Twist core leads
Thread by pre-soldering

Using a cutter knife (and taking care not to damage core leads), remove 10 to 12mm of sheath.

Fig. 9-3 Anode cable sheath peeling

9.4 ANODE CABLE JOINING PROCEDURE

- Join the cut anode cable and the new anode cable to restored as shown in Fig. 9-1. Also, when replacing the FBT, refer to section 7.15.1 "Anode cable connection and disconnection".
- Slip two silicon tubes (silicon tubes A and B in Fig. 9-4) onto the anode cables before making the join.
- Leave the silicon binder to harden overnight.
- The silicon binder is applied to guard the cable core leads from external air. Apply binder liberally. After completing the joint (at step ⑩ in Fig. 9-4-1 thru 2), make a hole in the silicon binder and check that the tube interior cannot be seen.


①
Silicon tube B
Silicon tube A
Anode cable
②
Minimum of 3 turns
③
Soldering iron
Solder
④
Silicon binder
⑤
Silicon tube B
Silicon tube A
⑥
Silicon tube A
Silicon binder (Apply liberally)
⑦
Heat (about 120° C)
Silicon tube A

① Slip silicon tube A and B over anode cable (either side)

NOTE : Silicon tube A : Short thin contracting tube
Silicon tube B : Long thick contracting tube
Supplied when ordering CRT assembly or the anode cable kit.

② Twist cables together through at least 3 turns.

③ Solder the joint, and pull at both ends. (Check against faulty soldering.)

④ Apply silicon binder liberally. (Cover the entire soldered section and remaining bare core leads.)

⑤ Cover the silicon binder section with silicon tube A. (With the center of the silicon tube A corresponding to the binder section)

⑥ Apply liberal amounts of silicon binder to both ends of silicon tube A

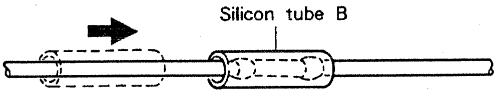
⑦ Apply heat (about 120° C) to contract silicon tube A.

Note : Use an industrial drier or soldering iron as the heat source.

Check that the silicon binder has been applied evenly without air pockets etc. If there are any pockets etc. apply additional silicon binder.

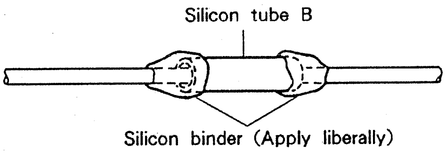
Fig. 9-4-1 Anode cable joining procedure (1)

⑧


Silicon tube B

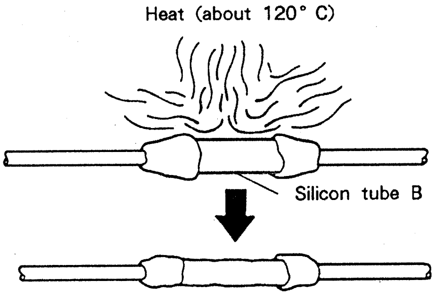
Slip silicon tube B over silicon tube A. (With the center of silicon tube B also corresponding to the binder section)

⑨


Silicon tube B
Silicon binder (Apply liberally)

Apply liberal amounts of silicon binder to both ends of silicon tube B.

⑩

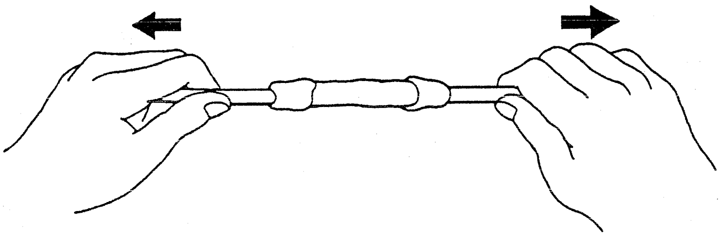

Heat (about 120° C)
Silicon tube B

Apply heat (about 120° C) to contract silicon tube B.

Note : Use an industrial drier or soldering iron as the heat source.

Check that the silicon binder has been applied evenly without air pockets etc. If there are any pockets etc. apply additional silicon binder.

⑪



Gently tug both ends to check that the cables do not separate.

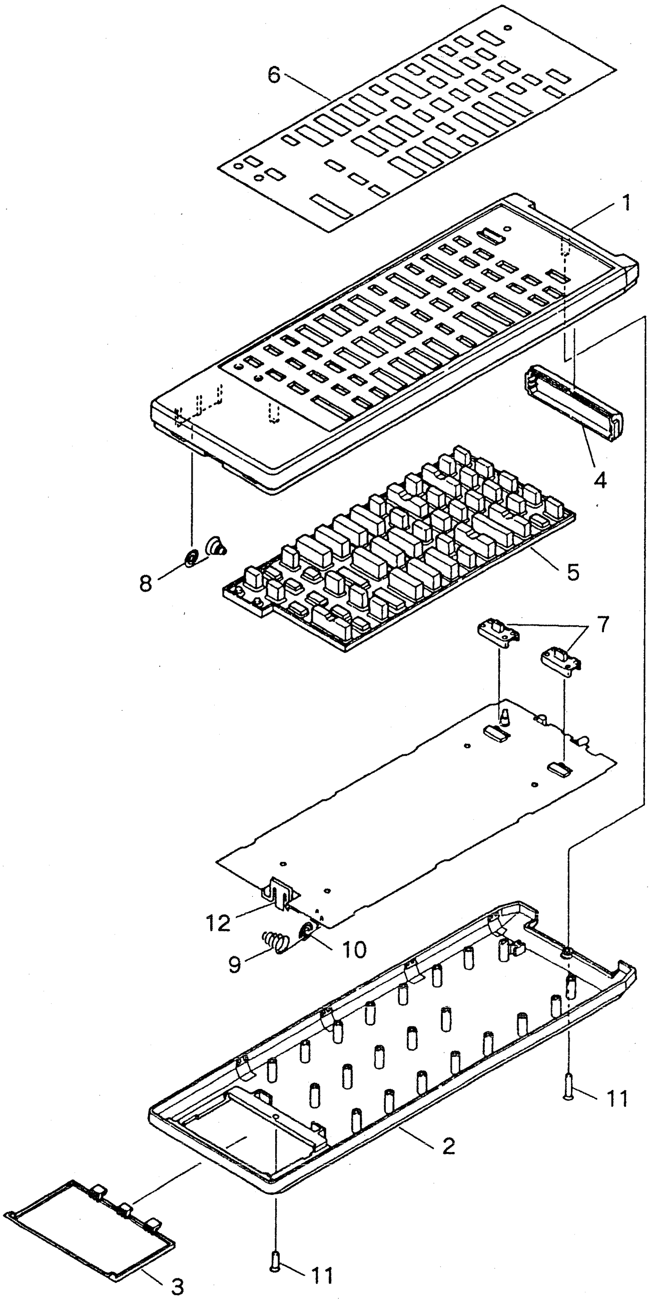
Fig. 9-4-2 Anode cable joining procedure (2)

10. REMOTE CONTROL UNIT

10.1 EXPLODED VIEWS AND PARTS LIST

NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Mark	No.	Part No.	Description
	1	AZA1157	Case (A)
	2	AZA1137	Case (B)
	3	AZA1138	Cover
	4	AZA1139	Filter
	5	AZA1160	Rubber sheet
	6	AZA1158	Name plate
	7	AZA1142	Knob (A)
	8	AZB1268	Spring
	9	AZB1269	Spring
	10	AZB1270	Spring
	11	AZA1146	Screw
	12	AZS1077	REMOTE POWER (SW1)



10.2 ELECTRICAL PARTS LIST

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5 %, and K = 10 %).

560 Ω → 56×10^1 → 561 .... RD1/4PS$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω → 47×10^3 → 473 .... RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω → 0R5 .... RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω → 010 .... RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562×10^1 → 5621 .... RN1/4SR$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1	PDG028-A
	IC2	AZC1232
	IC3	AZC1231
	Q1	AZC1229
	Q2	AZC1230
	D2	AZC1224
	D4	AZC1225
	D5	AZC1226
	D6 – D12	AZC1228

SWITCHES

Mark	Symbol & Description	Part No.
	S01,S03,S04,S06 Slide switch (SR RECALL/USE/LEARN, VDP/VCR/AUX)	AZS1074
	SW1 (REMOTE POWER)	AZS1077

CAPACITORS

Mark	Symbol & Description	Part No.
	C1,C2	CEAS101M6
	C3	CEAS100M16
	C4,C5 (100pF)	AZC1222
	C6,C8 – C10 (0.01μF)	AZC1220
	C7 (1000pF)	AZC1221

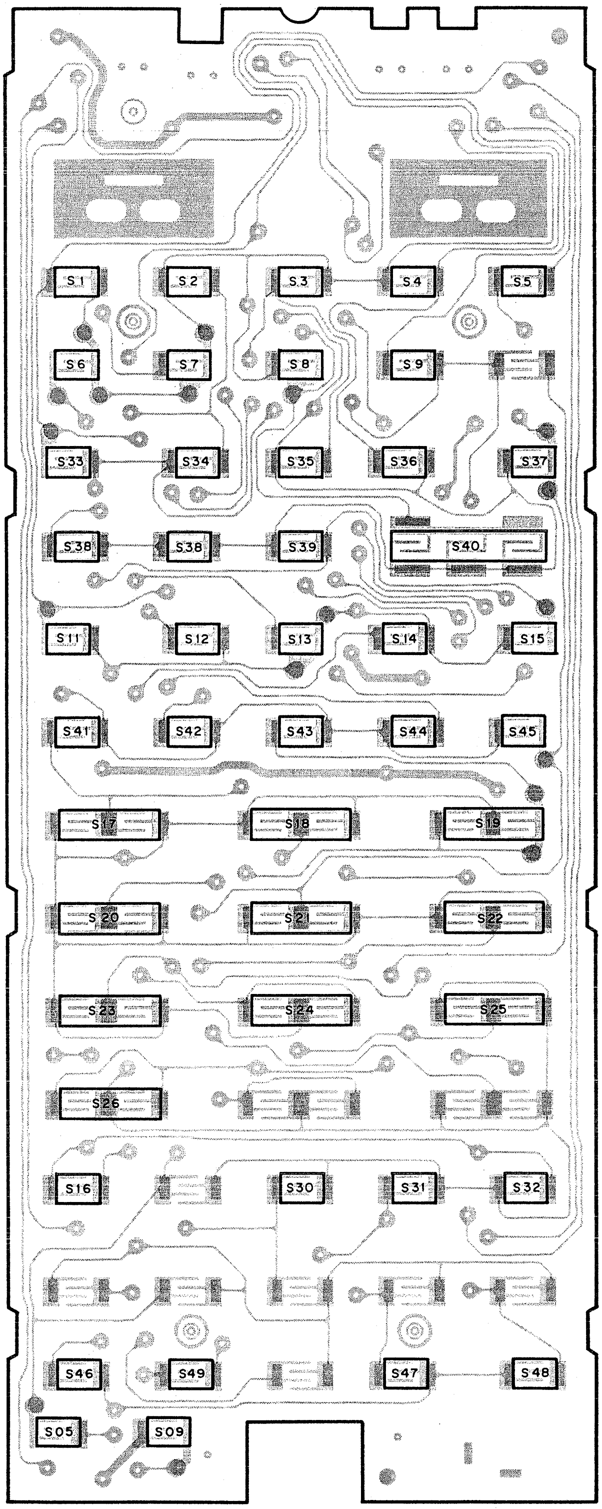
RESISTORS

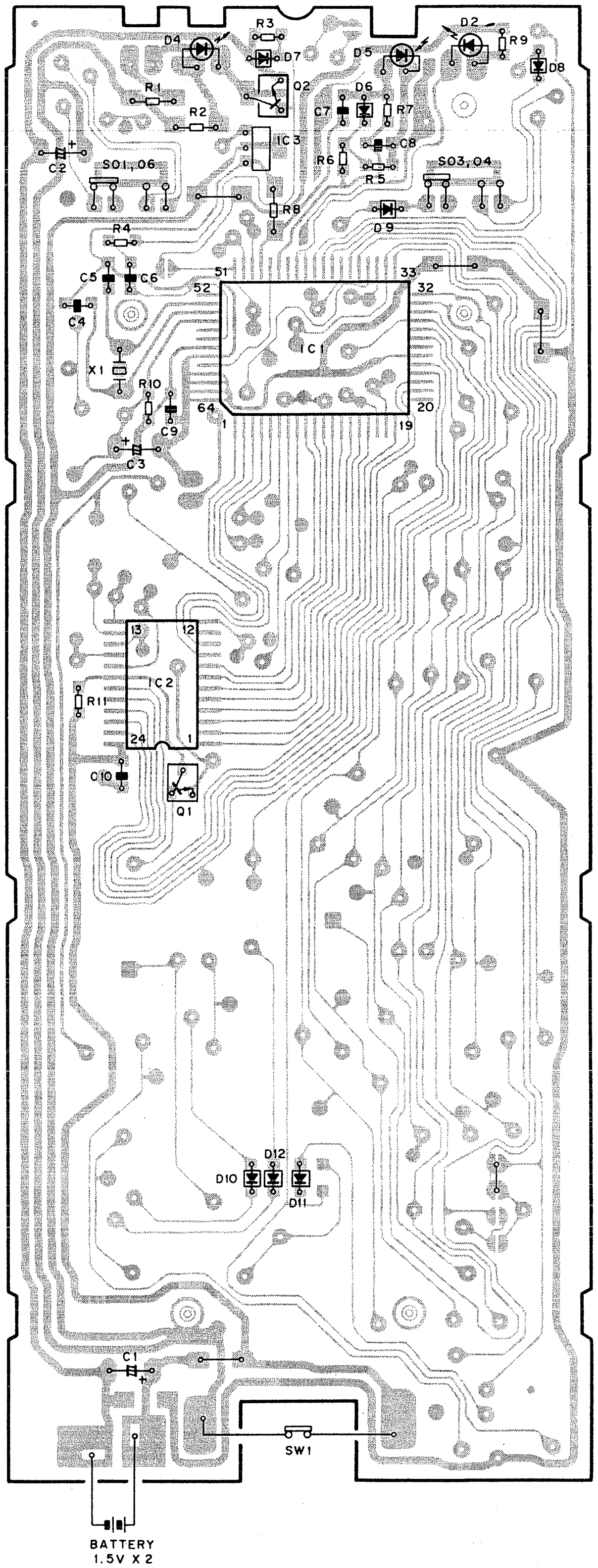
Mark	Symbol & Description	Part No.
	R2 (2.7Ω)	AZC1219
	R3 (100kΩ)	AZC1210
	R4 (680Ω)	AZC1217
	R5 (8.2kΩ)	AZC1214
	R6 (4.7kΩ)	AZC1215
	R7 (33kΩ)	AZC1211
	R8 (3.3MΩ)	AZC1218
	R9 (1kΩ)	AZC1216
	R10 (10kΩ)	AZC1213
	R11 (22kΩ)	AZC1212

OTHERS

Mark	Symbol & Description	Part No.
	X1 (2.0MHz)	AZC1223

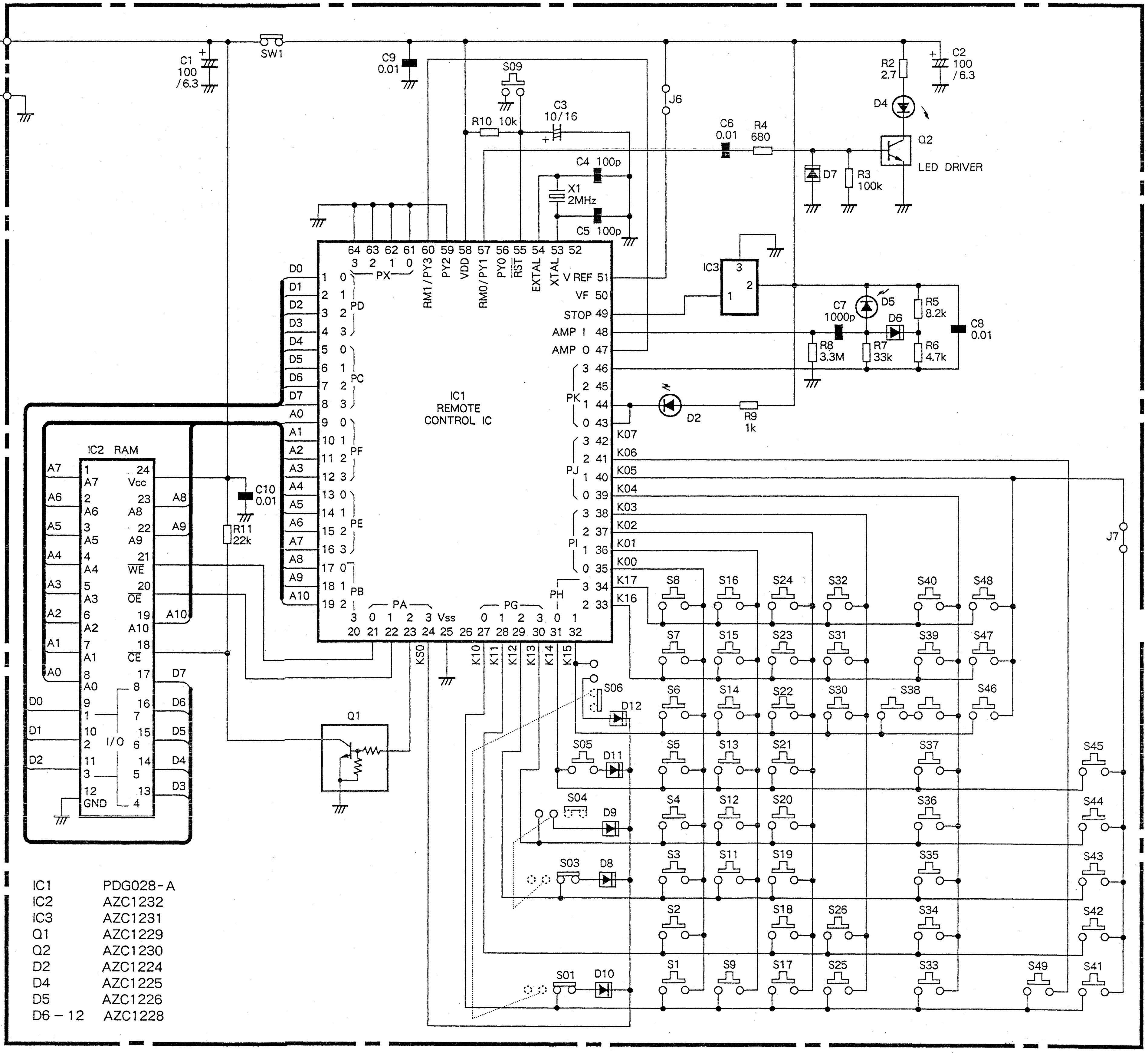
10.3 P.C. BOARDS PATTERN


S1
S2
S3
S4
S5
S6
S7
S8
S9
S33
S34
S35
S36
S37
S38
S38
S39
S40
S11
S12
S13
S14
S15
S41
S42
S43
S44
S45
S17
S18
S19
S20
S21
S22
S23
S24
S25
S26
S16
S30
S31
S32
S46
S49
S47
S48
S05
S09


R3
D2
D4
D7
D5
R9
D8
R1
Q2
D6
C7
R7
R2
IC3
C8
C2
S01, 06
R6
R5
S03, 04
R8
D9
R4
C5
C6
51
52
33
32
C4
IC1
X1
R10
64
20
C9
1
19
C3
13
12
IC2
R11
24
1
C10
Q1
D12
D10
D11
C1
SW1
BATTERY
1.5V X 2

10.4 SCHEMATIC DIAGRAM

REMOTE CONTROL UNIT (AXD1054)


BATTERY 1.5V × 2
C1 100 /6.3
SW1
C9 0.01
S09
R10 10k
C3 10/16
C4 100p
X1 2MHz
C5 100p
J6
C6 0.01
R4 680
R2 2.7
C2 100 /6.3
D4
Q2
LED DRIVER
D7
R3 100k
IC3
C7 1000p
D5
D6
R5 8.2k
C8 0.01
R8 3.3M
R7 33k
R6 4.7k
D2
R9 1k
IC1 REMOTE CONTROL IC
V REF 51
VF 50
STOP 49
AMP I 48
AMP O 47
RM1/PY3
PY2
VDD
RM0/PY1
PY0
RST
EXTAL
XTAL
PX
PD
PC
PF
PE
PB
PA
Vss
PG
PH
PK
PJ
PI
K07
K06
K05
K04
K03
K02
K01
K00
K17
K16
KS0
K10
K11
K12
K13
K14
K15
IC2 RAM
Vcc
WE
OE
CE
GND
I/O
C10 0.01
R11 22k
Q1
J7
S06
D12
S05
D11
S04
D9
S03
D8
S01
D10
S1 S2 S3 S4 S5 S6 S7 S8 S9
S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26
S30 S31 S32 S33 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43 S44 S45 S46 S47 S48 S49
D0 D1 D2 D3 D4 D5 D6 D7
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10

IC1	PDG028−A
IC2	AZC1232
IC3	AZC1231
Q1	AZC1229
Q2	AZC1230
D2	AZC1224
D4	AZC1225
D5	AZC1226
D6 − 12	AZC1228

1. RESISTORS :
   Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2. CAPACITORS :
   Indicated in capacity (μF) ⁄voltage (V) unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

3. OTHERS :
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

4. SWITCHES : (The underlined indicates the switch position)
   SW1 : REMOTE POWER

	VDP	VCR	AUX
S01	ON	OFF	OFF
S06	OFF	OFF	ON

	SR RECALL	USE	LEARN
S03	ON	OFF	OFF
S04	OFF	OFF	ON

S05 : M − CLR
S09 : RESET

S1 : TV ⎤
S2 : VDP ⎥ POWER
S3 : VCR ⎥
S4 : AUX ⎦
S5 : SLEEP
S6 : TV ⎤
S7 : VDP ⎥ INPUT
S8 : VIDEO 1 ⎥ SELECT
S9 : VIDEO 2 ⎦
S11 : − ⎤ TV CHANNEL
S12 : + ⎦
S13 : MUTE
S14 : − ⎤ MASTER VOLUME
S15 : + ⎦
S16 : MTS
S17 : 1
S18 : 2
S19 : 3
S20 : 4
S21 : 5
S22 : 6
S23 : 7
S24 : 8
S25 : 9
S26 : 0

S30 : CH RETURN
S31 : ANT
S32 : DISPLAY
S33 : ⏮ ⁄ − ⎤ VCR⁄CH
S34 : ⏭ ⁄ + ⎦
S35 : ⏸ ⁄ ▶◀
S36 : ◀◀
S37 : ▶▶
S38 : REC
S39 : ■ ⁄ ⏏
S40 : ▶
S41 :
S42 :
S43 : MODE ⎤ SURROUND
S44 : − ⎤ VOLUME ⎦
S45 : + ⎦
S46 : STD⁄AV MEMORY
S47 : ◁ ⎤ ADJUST
S48 : ▷ ⎦
S49 : PICTURE⁄SOUND

NOTE :

—▭— : Indicates a chip resistor.
—▮— : Indicates a chip capacitor.
⊣K⊢ : Indicates a chip transistor.
⊣▶|⊢ : Indicates a chip diode.

10.5 IC DESCRIPTION

■PDG028 – A

Remote control microcomputer

●Pin Function

Pin	I/O	Pin name	Function	Active	Pin	I/O	Pin name	Function	Active
1	I/O	PD0	I/O 1 } SRAM data	–	35	O	PI0	Key-scan strobe output	L
2		PD1	I/O 2		36		PI1		
3		PD2	I/O 3		37		PI2		
4		PD3	I/O 4		38		PI3		
5		PC0	I/O 5		39		PJ0		
6		PC1	I/O 6		40		PJ1		
7		PC2	I/O 7		41		PJ2		
8		PC3	I/O 8		42		PJ3	N.C.	
9	O	PF0	A0 } SRAM address	H	43	O	PK0	Output for LED	H
10		PF1	A1		44		PK1		
11		PF2	A2		45		PK2	N.C.	
12		PF3	A3		46		PK3	Control for photo-diode power supply	
13		PE0	A4		47	O	AMP0	Analog amp. output for remote control signal.	H
14		PE1	A5		48	I	AMP1	Analog amp. input for remote control signal.	–
15		PE2	A6		49	I	STOP	Control input for hardware stop	L
16		PE3	A7		50		VF	N.C.	
17		PB0	A8		51	O	VREF	Zener for descrease-voltage detection	H
18		PB1	A9		52		N.C	N.C.	
19		PB2	A10		53		XTAL	Connect the ceramic resonator for clock osillation (2MHz)	
20		PB3	N.C.		54	-	EXTAL		
21	O	PA0	SRAM WE (write enable)	L	55	I	$\overline{\text{RST}}$	Reset input	L
22		PA1	SRAM OE (output enable)		56		PY0	N.C.	
23		PA2	SRAM CE (chip enable)	H	57	O	RM0/PY1	Remote-control output	H
24		PA3	Scan-signal output for diode switches	L	58		VDD	Power supply voltage (+3V)	
25		Vss	Ground		59	I	PY2	Ground	
26		NC	N.C.		60		RM1/PY3	Remote-control input	H
27	I	PG0	Key-scan input	L	61		PX0	Ground	
28		PG1			62		PX1		
29		PG2			63		PX2		
30		PG3			64		PX3		
31		PH0							
32		PH1							
33		PH2							
34		PH3							

11. IC DESCRIPTION

■PD5084 – A

TV system control microcomputer

●Pin Function

Pin	I/O	Pin name	Function	Operation	Active
1	O	VDP 0	VOLUME	PWM output for D/A converter	L
2		VDP 1	BASS		
3		VDP 2	TREBLE		
4		VDP 3	CONTRAST		
5	I	$\overline{\text{INT}}$	REMOTE CONTROL	Remote control signal input	
6	O	VDP 8	SURROUND VOLUME CONT OUT	PWM output for D/A converter	L
7		M1	V. MUTE	Muting output for video	H : MUTE
8		M0	TV. MUTE	Muting output for TV tuner	
9		D/A	A/D CONT	Pulse output for A/D input switch	H
10		P2	STB	Control for C MOS (CXD1067P)	
11		P1	DATA		
12		P0	CLK		
13		F3	INPUT	Logic output for input switch	∗1
14		F2			
15		F1	INI	Control for M NOS (CXK1005P)	
16		F0	$\overline{\text{CLK}}$		
17	I/O	G3	I/O 1	M NOS (CXK1005P) data input /output	
18		G2	I/O 2		
19		G1	I/O 3		
20		G0	I/O 4		
21	I	H3	KEY SCAN	Key scan input	
22		H2			
23		H1			
24		H0			
25	I/O	TEST	TEST	Ground	
26		Vss	GND		
27	I	$\overline{\text{AC}}$	$\overline{\text{RESET}}$	Reset	
28	O	OSC OUT	OSC OUT	Oscillator output for internal clock	

Pin	I/O	Pin name	Function	Operation	Active
29	I	OSC IN	OSC IN	Oscillator input for internal clock	
30	O	J0	KEY SCAN	Key scan output (Normal : H)	L
31		J1		Key scan output (Normal : L)	H
32		J2			
33		J3			
34	I	D	SURROUND	Input of the surround circuit detection	H
35		A/D	A/D	3 bit A/D for AFT/DPO	
36		L0	HS	HS counter input	
37	O	L1	CE	PLL (TD6359P) control	
38		L2	DATA		
39		L3	CLK		
40	O	VDP 4	BRIGHT	PWM output for D/A converter	L
41		VDP 5	COLOR		
42		VDP 6	SHARPNESS		
43		VDP 7	TINT		
44	O	OUT	RGB OR	Character generator output	H
45		B	TELOP B		
46		G	TELOP G		
47		R	TELOP R		
48	O	OSC 2	OSC 2	Oscillator output for character generator	
49	I	OSC 1	OSC 1	Oscillator input for character generator	
50	I	V. SYNC	VBL	VBL input for character generator	
51		H. SYNC	HBL	HBL input for character generator	
52		VDD	VDD	Power supply voltage input (+5V)	

∗1

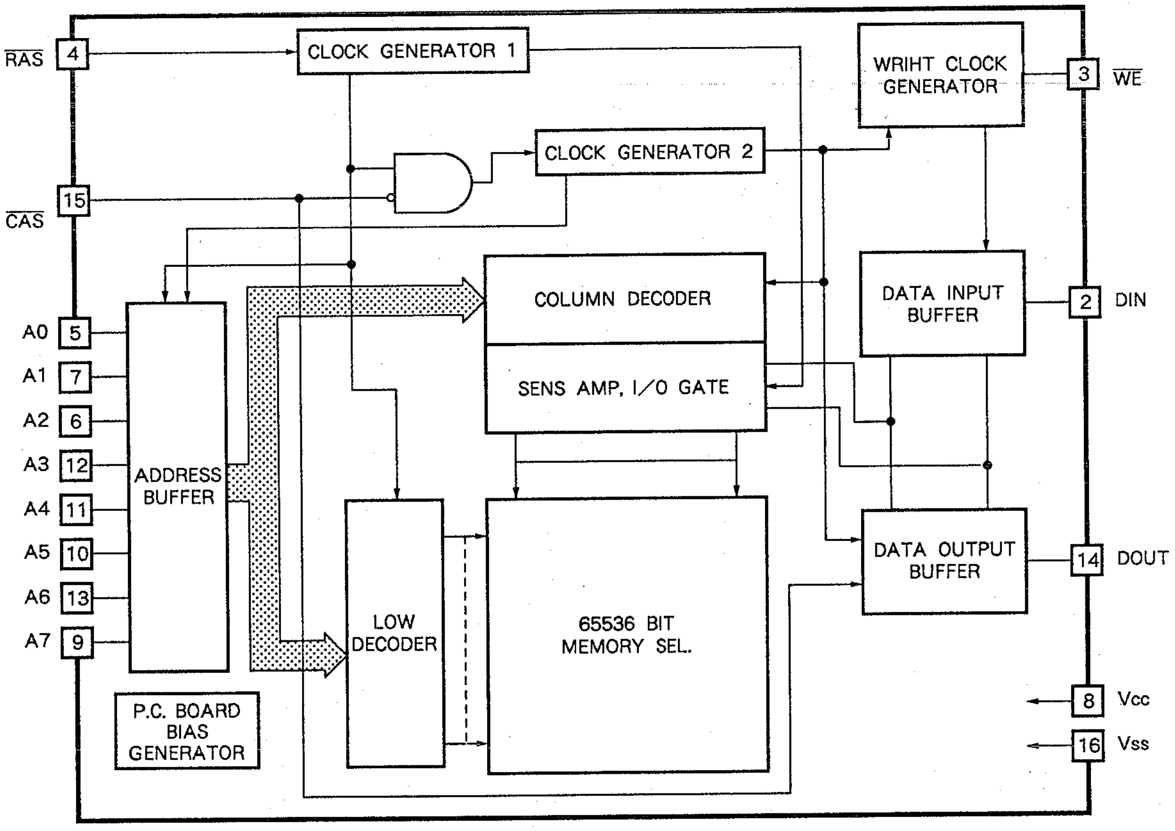
●Truth table for pin 13, 14

PIN \ FUNC.	TV	VDP	VIDEO 1	VIDEO 2
13	H	H	L	L
14	H	L	H	L

■LM3364K − 15

D-RAM used in SURROUND circuit

●Block diagram


RAS
4
CLOCK GENERATOR 1
WRIHT CLOCK GENERATOR
3
WE
CLOCK GENERATOR 2
15
CAS
COLUMN DECODER
DATA INPUT BUFFER
2
DIN
A0 5
A1 7
A2 6
A3 12
A4 11
A5 10
A6 13
A7 9
SENS AMP, I/O GATE
ADDRESS BUFFER
DATA OUTPUT BUFFER
14
DOUT
LOW DECODER
65536 BIT MEMORY SEL.
8
Vcc
16
Vss
P.C. BOARD BIAS GENERATOR

12 HOW TO CLEAN

Note : Avoid fingerprints on the optical system parts such as the lens and mirror so be sure not to hold them with rear hand.

12.1 HOW TO CLEAN LENS AND MIRROR

When cleaning the lens and mirror, use the following specified cloth.
Cleaning cloth······SAVINA MINIMAX (Manufactured by Kanebo Textile (Co LTD), etc.

1. Be sure to remove sand dust with an air brush, etc.
2. When it is stained slightly, breathe upon it and wipe away with the specified cleaning cloth.
   For other stains than the above, wipe the stains away with the specified cloth into which a cleaning liquid has been soaked.

Cleaning liquid·····LENS LUSTER (Manufactured by Edmund Scientific Co.), etc.

12.2 HOW TO CLEAN SCREEN

When cleaning the screen, use a soft cloth so as not to damage the screen.

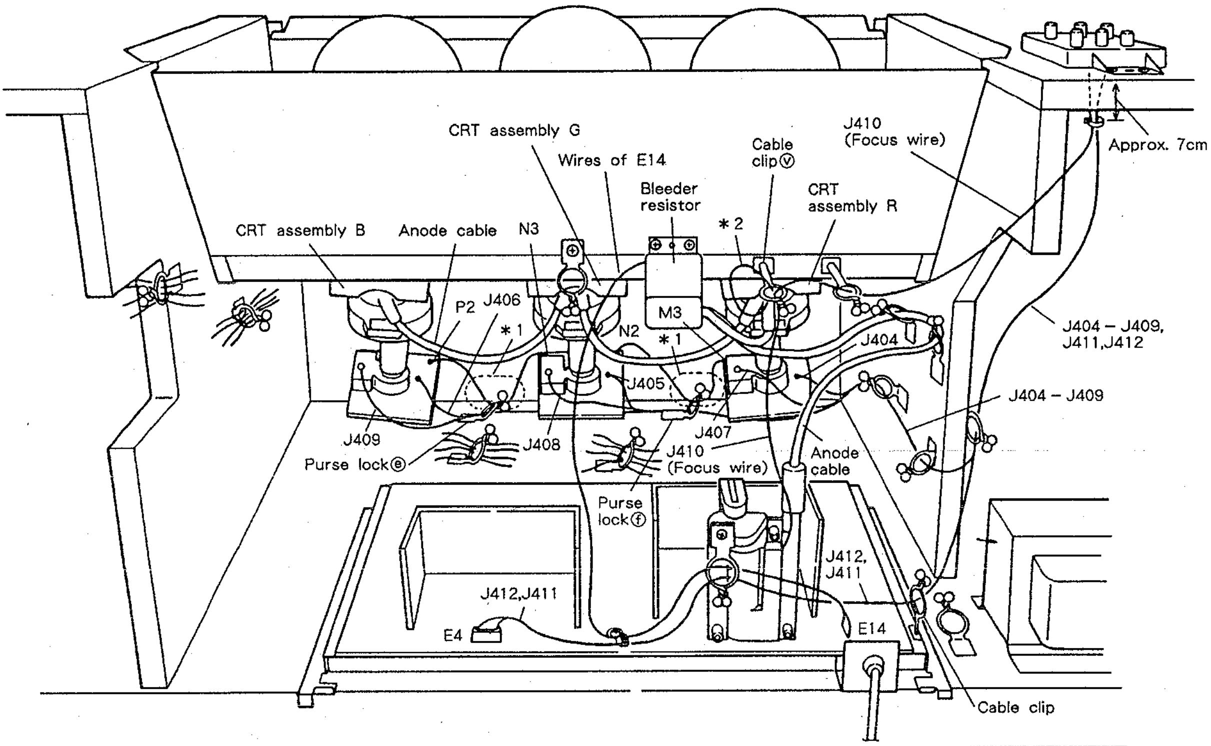
1. Wipe the stain away with a diluted neutral detergent soaked cloth.
2. Wipe the detergent away with a water soaked cloth.
3. Wipe the screen with a dry cloth to remove moisture on the screen.

Note : Absolutely do not use alcohol, benzine, thinner, etc. for cleaning in order not to wipe away the black print on the surface.

13. WIRING DIAGRAM

When reassembling the wiring rods of this set once disassembled, be sure to recover the styling of wiring rods as it was. The wiring rods that are the most important for styling are the focus screen wires, the anode cable, and jumper wires connecting P2 to N3 and N2 to M3. The following wiring diagram is provided only for reference, and subject to possible changes without notice. Care should be taken so that the wiring rods styling of this set is recovered as it was before disassembling.

*1 : Jumper wires (3P) connecting P2 to N3 and N2 to M3 are made the U-shape and pass thru purse locks ⓔ and ⓕ.
*2 : The slacked part of the focus wire (J410) should be secured with cable clip ⓥ.


CRT assembly G
Wires of E14
Cable clipⓥ
J410 (Focus wire)
Bleeder resistor
CRT assembly R
CRT assembly B
Anode cable
N3
*2
Approx. 7cm
P2
J406
*1
M3
N2
*1
J404
J404 – J409, J411,J412
J405
J404 – J409
J409
Purse lockⓔ
J408
J407
J410 (Focus wire)
Anode cable
Purse lockⓕ
J412, J411
J412,J411
E4
E14
Cable clip

Note ; J404 : Red screen
J405 : Green screen
J406 : Blue screen
J407 : Red focus
J408 : Green focus
J409 : Blue focus

Fig. 13-1 Wiring diagram

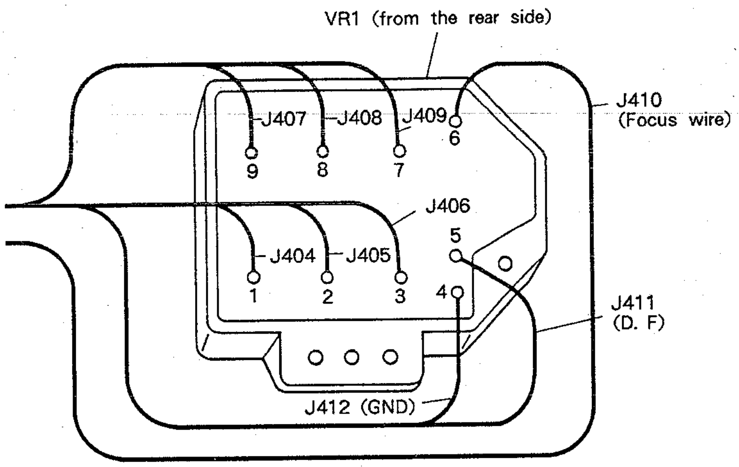

VR1 (from the rear side)
J410
(Focus wire)
J407
J408
J409
6
9
8
7
J406
5
J404
J405
1
2
3
4
J411
(D. F)
J412 (GND)

Fig. 13-2 VR1 connections

14. FOR SD-P502-WD/KUX1C TYPE

CONTRAST OF MISCELLANEOUS PARTS

NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- Parts marked by ☆ are important parts which use X-rays.
  If any of these parts need to be replaced, always replace with specified parts.
- Parts having the (T) mark are for the KUX1C type manufactured by Harvey Manufacturing, Inc., and parts having the (L) mark are for the KUX1C type manufactured by PIONEER ELECTRONICS TECHNOLOGY, INC.

The SD-P502-WD/KUX1C type is the same as the SD-P502-QD/KUX1C type with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		SD-P502-QD/KUX1C type	SD-P502-WD/KUX1C type	
	Upper carton	AHD1423	AHD1511	For packing
	Cabinet	Non supply	Non supply	
	Door L	AMR1461	AMR1477	
	Door R	AMR1462	AMR1478	

15. FOR SD-P452-Q/KUX1C AND SD-P452-W/KUX1C TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- Parts marked by ☆ are important parts which use X-rays.
  If any of these parts need to be replaced, always replace with specified parts.
- Parts having the (T) mark are for the KUX1C type manufactured by Harvey Manufacturing, Inc., and parts having the (L) mark are for the KUX1C type manufactured by PIONEER ELECTRONICS TECHNOLOGY, INC.

The SD-P452-Q/KUX1C and SD-P452-W/KUX1C types are the same as the SD-P502-QD /KUX1C type with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		SD-P502-QD /KUX1C type	SD-P452-Q /KUX1C type	SD-P452-W /KUX1C type	
	Door assembly	AAN1075	AAN1076	AAN1076	
	Spacer H	AAP1063	AAP1094	AAP1094	
	Spacer L	AAP1069	AAP1095	AAP1095	
	Screen frame H	AAP1085	AAP1088	AAP1088	
	Screen frame V	AAP1087	AAP1090	AAP1090	
	Screen frame EH	AAP1104	AAP1089	AAP1089	
	Under carton	AHD1422	AHD1456	AHD1456	For packing
	Upper carton	AHD1423	AHD1455	AHD1512	For packing
	Side panel	AMB1359	AMB1363	AMB1363	
	Cabinet	Non supply	Non supply	Non supply	
	Fresnel	AMR1343	AMR1344	AMR1344	
	Lenticular sheet	AMR1346	AMR1347	AMR1347	
	Mirror	AMR1521	AMR1522	AMR1522	
☆	CRT assembly R	AWY1039	AWY1041	AWY1041	
☆	CRT assembly B	AWY1040	AWY1042	AWY1042	
	Door L	AMR1461	• • • • •	• • • • •	
	Door R	AMR1462	• • • • •	• • • • •	

PIONEER®
The future of sound and vision.

PROJECTION MONITOR RECEIVER

SD-P502/SD-P452

DOLBY SURROUND

NTSC

Operating Instructions

Congratulations on your purchase of the PIONEER Projection Monitor Receiver.
If you have not read the cautionary instructions on the front cover, please do so before proceeding.
After learning how to operate the Projection Monitor, be sure to keep this manual handy for future reference.

These operating instructions are for:
SD-P502; 50in screen size, AC 120V model.
SD-P452; 45in screen size, AC 120V model.
The illustrations and text in this manual refer basically to SD-P502.
Also, while the official name of the product is the "PROJECTION MONITOR RECEIVER," for the sake of brevity the text refers to it as the "Projection Monitor" or just the "Monitor."

Contents

3 IMPORTANT NOTICE
IMPORTANT/CAUTION ON PROJECTION MONITOR WITH DOOR
4 PRELIMINARY INSTRUCTIONS
5 FEATURES
6 INSTALLATION
7 INSERTING BATTERIES IN THE REMOTE CONTROL UNIT
7 OPERATING PRECAUTIONS
8 FRONT PANEL FACILITIES
10 SYSTEM CONNECTION DIAGRAM
12 ANTENNA CONNECTIONS
12 USING THE ANTENNA CABLE CONNECTOR
12 SYSTEM REMOTE CONTROL CONNECTIONS
13 SPEAKERS
14 SURROUND SPEAKER SYSTEM
15 HOW TO ALIGN COLOR CONVERGENCE
16 TV CHANNEL SELECTION
19 CHANNEL MEMORY
20 PICTURE AND TONE ADJUSTMENT
21 AV MEMORY
21 DPO ADJUSTMENT
22 SYSTEM SWITCH
23 BLOCK DIAGRAM
23 REMOTE CONTROL OPERATION RANGE
24 TROUBLESHOOTING
25 CARE OF YOUR PROJECTION MONITOR
26 SPECIFICATIONS

IMPORTANT NOTICE

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO WET LOCATIONS.

The Model number and the serial number of this Projection Monitor are located on the rear panel. Please write the serial number on the enclosed warranty card and keep it in a safe place for future reference.

NOTE:
There are no user serviceable parts inside the Projection Monitor.

IMPORTANT

The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

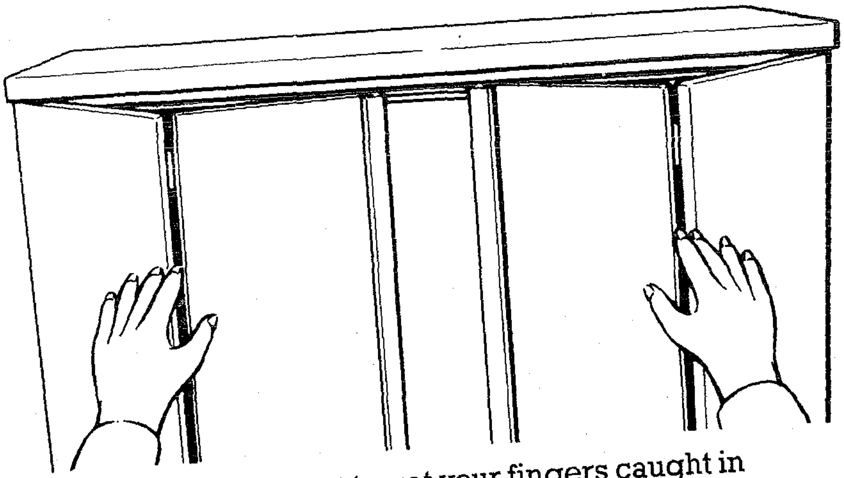
CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:
TO PREVENT THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION ON PROJECTION MONITOR WITH DOOR



Be careful not to get your fingers caught in the door.

PRELIMINARY INSTRUCTIONS

WHERE TO PUT THE MONITOR

LIGHTING

Bright lights or direct sunlight will dull the picture. Set the monitor so that the screen faces away from windows.

AIR CIRCULATION

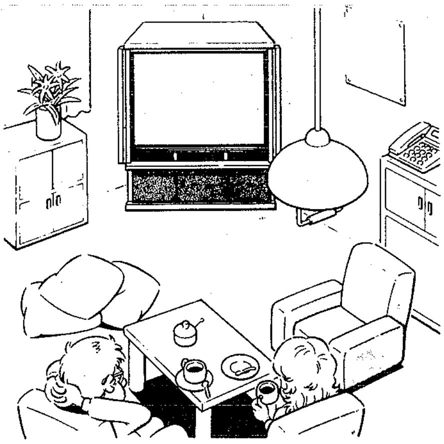
Leave space for air to circulate in the back of the set. Keep away from curtains and other furnishings that could block ventilation.

HEAT DAMAGE

Damage may occur if you leave the set in direct sunlight or near a heater.

OPTIMUM VIEWING DISTANCE

10 to 23 feet is the range recommended for viewing comfort.



POWER SOURCE

This Projection Monitor runs on AC 120V, standard house current.

NEVER CONNECT THE PROJECTION MONITOR TO OTHER THAN THE SPECIFIED VOLTAGE, OR TO DIRECT CURRENT.

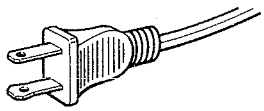
POWER OUTLET

- This set requires an AC 120 volt polarized outlet. The plug will only fit one way. If it will not go in, turn it around and try the other way. If you still are unable to insert the plug, call an electrician to replace the wall socket.
- A damaged cord or plug is a fire hazard. If you notice wear or damage, have it fixed by qualified service personnel.
- Plug directly into the wall socket. Do not use extension cords or other receptacles. Do not overload the outlet; it may cause a fire hazard.

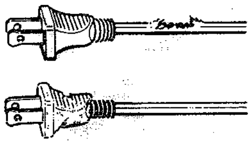
NOTE:

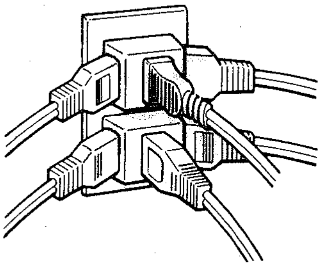
- *Never remove the back cover of the Projection Monitor as this will expose you to dangerously high voltage and other hazards. If the set does not operate properly, unplug it and refer to page 24.*

- POLARIZED PLUG



- DANGEROUS





FEATURES

Sharp, Clear Images with 700-line Horizontal Resolution. (SD-P452: 650-line)
- Sharp detail and crisp outlines, thanks to 10MHz video bandwidth and Dynamic Picture Control circuitry.
- New, high-resolution picture tubes improve focussing performance by 30%.
- Dynamic focussing circuit enhances resolution at picture edges.

Amazingly Bright Picture Intensity of 300 Foot-Lambert (SD-P452: 350 Foot-Lambert)
- New, highly-efficient lens system passes more light.
- High-power picture tubes employ advanced anode stabilization circuitry and 6000pF capacitors.

Much Greater Contrast with Extended Gradation
- True black reproduction under all conditions, thanks to Dynamic Black Level Correction Circuit.

Microcomputerized Dynamic Picture Optimizer (DPO) and AV Memory
- DPO (Dynamic Picture Optimizer) circuit detects room light and optimizes the TV picture accordingly.
- AV Memory lets you store and recall your picture and quality settings.

Equipped with Dolby Surround System—Movie Theater Ambience in Your Living Room
- This unit is equipped with a Dolby Surround decoder. This lets you enjoy theater-like surround sound in your living room.
- This surround system is designed for use with video programs (mostly movies on videotape) recorded with the Dolby Surround system. These usually have the DD DOLBY SURROUND mark on the videocassette label. This system gives an impression of left-right and front-back movement to match the action on screen.

- *DD DOLBY SURROUND manufactured under license from Dolby Laboratories Licensing Corporation.*
- *"DOLBY" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.*

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INSTALLATION

ANTENNA CONNECTION

Connect to an outdoor antenna or a cable box or centralized antenna terminal. (See page 12 for details.)

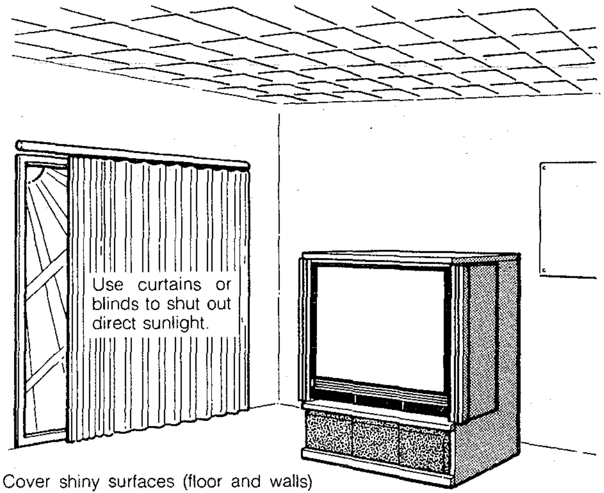
MOUNTING

The Projection Monitor is designed to be placed on the floor or on a sturdy platform. The mounting surface should be flat and steady.

INSTALLATION PRECAUTIONS:
Place of Installation

- *When the Projection Monitor is operating, it is cooled by air-flow through ventilation holes in the rear and bottom. Therefore, avoid placing it in locations where the cooling air-flow is hindered (for example, against a wall).*
- *Avoid places subject to extremely high temperature or humidity, or to temperatures of 41°F (5°C) or lower. Also avoid dusty places.*
- *Do not set the Projection Monitor in an unstable position (such as on a shaky or a tilted platform).*
- *When setting the Projection Monitor on a floor of soft material, make sure that the floor material is not damaged by the weight of the Projection Monitor.*
- *If the room temperature suddenly rises (or if the Projection Monitor is moved from a cool place to a hot place), dew condensation may occur on the lenses, resulting in picture distortion or color fading. In such a case, simply wait a while (with the POWER SWITCH on) and the dew will disappear.*

Downward spot lights or fluorescent lights in an overhead "Honeycomb" prevent direct illumination of the screen.



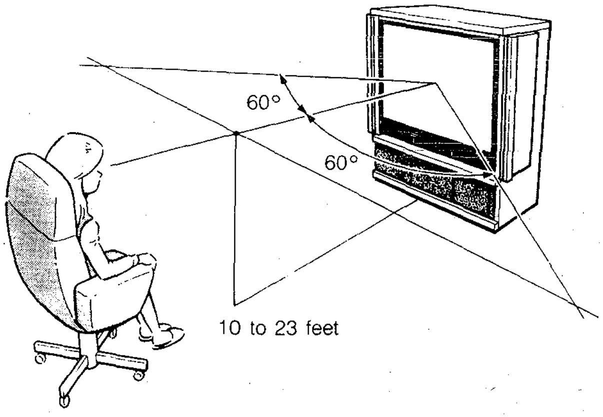
Use curtains or blinds to shut out direct sunlight.

Cover shiny surfaces (floor and walls) with non-reflective materials, (carpet, rugs, wallpaper, etc.).

RECOMMENDED VIEWING AREA

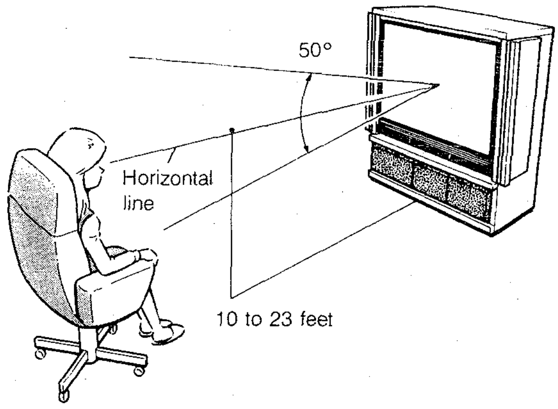
See page 20 for instructions on how to adjust the picture and sound.

HORIZONTAL BEST VIEWING ANGLE



VERTICAL BEST VIEWING ANGLE

Watch from at least three meters away from the screen. (Optimum viewing distance is four to six meters.)



You may sometimes see double images or rainbow-like effects if you view from outside of the recommended area shown here.

INSERTING BATTERIES IN THE REMOTE CONTROL UNIT

■ For details, see the separate operating instructions for the remote control unit.

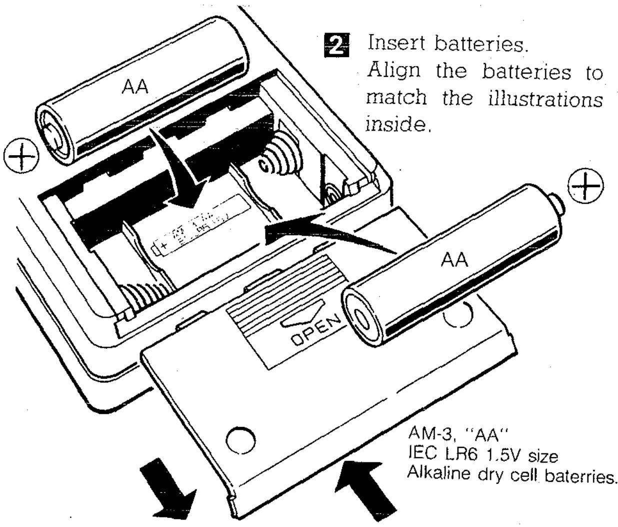
You will find the remote control unit packed inside the projection monitor box. Open the remote and insert the batteries. Follow the procedure below:

1. Open the battery compartment on the rear of the remote control unit. Press down with your thumb while sliding the lid outward.
2. Note the polarity (+ and −) markings in the case. Insert the supplied batteries so that they match the markings.
3. Close the lid by sliding it back in until it clicks into place and press reset button with pen point. The remote control unit is now ready to use.

NOTES:

- *Never use old and new batteries together. When replacing batteries, always replace the two old batteries with two new ones.*
- *Do not lay books or other objects on top of the remote control unit. The operation keys may be depressed, causing a continuous flow of battery power.*
- *See the remote control unit operating instructions for further detail.*

INSERTING BATTERIES



2 Insert batteries. Align the batteries to match the illustrations inside.

1 Open by pressing with your thumb while sliding outward.

3 Close the lid by sliding back into place.

OPERATING PRECAUTIONS

Keep away from magnetic fields

The picture may be distorted if strong magnetic fields are nearby External speakers should be set at least two feet (50cm) away from the Projection Monitor. Electric fans and other motor driven appliances and toys may also be sources of magnetism.

When moving the monitor

Pull out the plug and move the set carefully. Be particularly careful not to bump or scratch the screen. To avoid damage to the casters you may need to lift the set when going over irregular surfaces.

Install in a flat, steady place

Do not put the Projection Monitor on a surface that is tilted, unsteady or prone to shake or vibrate. A shaky or slanted platform is dangerous.

Adjust room illumination

Excessively bright or dim lighting may strain your eyes. Draw the curtains if necessary to shut out direct sunlight.

When not using the set for a long time

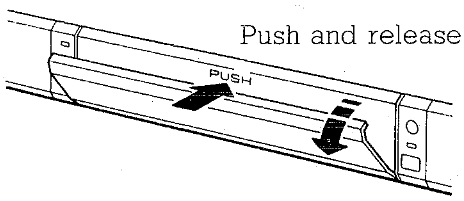
For safety, unplug the power cord when leaving the set turned off for long period of time.

Dew (condensation) and picture blurring

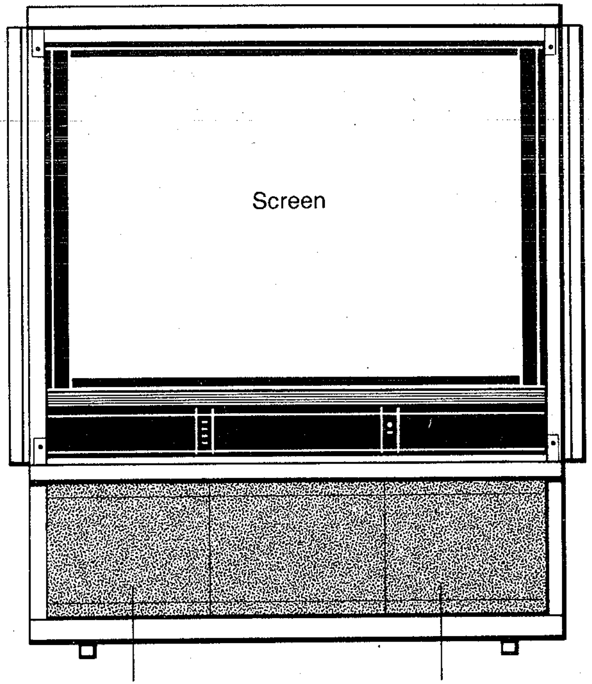
- You may see a blurred picture if the set is moved from a cool to a warm location or if room temperature rises very rapidly. This occurs when moisture from the air condenses on the optical parts.
- The picture will return to normal if you leave the set turned on for an hour or two.
- A gradual change in temperature can prevent dew formation.

FRONT PANEL FACILITIES

A flip-down door conceals the control panel. Push gently and release to open the door.
To close the door, lift it back up into place.

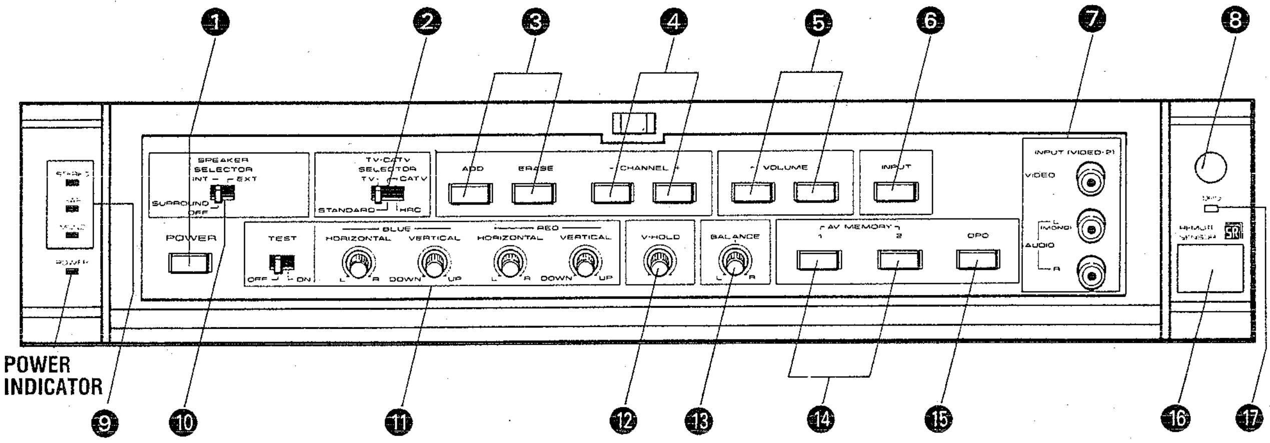


Push and release to open.


Screen
Left Speaker
Right Speaker

NOTE:
- *If you accidentally pull the door open then it may not shut properly. Push in when shutting the door to restore normal operation.*

Control Panel


❶
❷
❸
❹
❺
❻
❼
❽
SPEAKER SELECTOR
INT
EXT
SURROUND
OFF
POWER
TV·CATV SELECTOR
TV
CATV
STANDARD
HRC
ADD
ERASE
CHANNEL
VOLUME
INPUT
INPUT (VIDEO·2)
VIDEO
AUDIO
L (MONO)
R
TEST
OFF
ON
BLUE
RED
HORIZONTAL
VERTICAL
L
R
DOWN
UP
V-HOLD
BALANCE
AV MEMORY
1
2
OPC
REMOTE SENSOR
POWER INDICATOR
❾
❿
⓫
⓬
⓭
⓮
⓯
⓰
⓱

★ Use the remote control unit to operate most functions. See the separate operating instructions for the remote control unit.

AV Memory

After adjusting the picture and sound quality you can store your settings in "AV memory." Two AV memory settings can be stored and recalled. Use the front panel buttons to save settings. Use the STD/AV MEM key on the remote control unit to recall them.

FRONT PANEL FACILITIES

❶ POWER SWITCH

Press once to turn on the power. Press again to turn off. The POWER indicator illuminates when the power is on.

❷ TV-CATV SELECTOR

Set to the position that corresponds to the kind of broadcasts you receive, regular TV or CATV (STANDARD or HRC).

❸ CHANNEL MEMORY BUTTONS

The ADD and ERASE buttons let you choose which channels are tuned in when you use the CHANNEL selector (+ and –) keys. (See page 19 for details.)

CHANNEL ADD: Includes the current channel in channel memory.

CHANNEL ERASE: Deletes the current channel from channel memory.

❹ CHANNEL SELECTOR

Press plus (+) or minus (–) to tune to a higher or lower channel. Only those channels in channel memory can be tuned in by this method. (See page 16 for details.)

❺ VOLUME CONTROL BUTTONS

Press the plus (+) or minus (–) button to raise or lower the volume.

❻ INPUT SELECTOR

Press to select your program source: TV, video disc player (VDP), VCR1, or VCR2. Each press of the button changes the selection to the next source.

❼ INPUT JACKS (VIDEO-2)

These front panel jacks are handy for a portable VCR or other temporary video source connection. The rear panel also has VIDEO-2 input jacks. These function identically to those on the front. But both the front and rear jacks can not be used at the same time.

❽ DPO SENSOR

This detects ambient lighting for the DPO (Dynamic Picture Optimizer) circuit which optimizes the TV picture accordingly.

❾ MTS (Multi-channel Television Sound) MODE INDICATORS

These illuminate to confirm the broadcast sound format.

STEREO: Means that the program on your currently selected channel is in stereo.

SAP: Means that the program on your selected channel includes SAP (second audio program) sound.

MONO: Means that mono mode is selected regardless of audio signal format of received program.

❿ SPEAKER SELECTOR

This lets you select either the built-in speaker or external speakers. (See page 13)

NOTE:

- *Set to INT when using the built-in speakers. Do not use the INT setting if using speakers connected to the rear panel external speaker terminals in a Dolby Surround sound reproduction system. (No sound will be heard from the external speakers.)*
- *Set to EXT if using external speakers, an external audio system, or surround speakers. At the EXT setting, no sound comes from the internal speakers.*

⓫ TEST PATTERN SWITCH AND CONVERGENCE CONTROLS

These controls are used to adjust the color convergence. Turning on the TEST switch (during active channel reception) puts a test pattern on the screen for adjustment. (See page 15 for details.)

⓬ VERTICAL HOLD CONTROL

Adjust this knob if necessary to stop the picture from rolling.

⓭ BALANCE CONTROL

Adjusts volume balance between the right and left speakers.

⓮ AV MEMORY SWITCHES (1 and 2)

These buttons let you store two sets of audio and video settings (AV MEMORY-1 and-2) for later recall. This can save you the trouble of readjusting the picture and sound for particular channels or program sources.

⓯ DPO (Dynamic Picture Optimizer) SWITCH

You can turn DPO on or off as desired. When DPO is on, it automatically adjusts the picture to compensate for room illumination. (See page 21 for details.)

⓰ REMOTE CONTROL SENSOR

This sensor picks up infrared signals from the remote control unit.

⓱ DPO INDICATOR

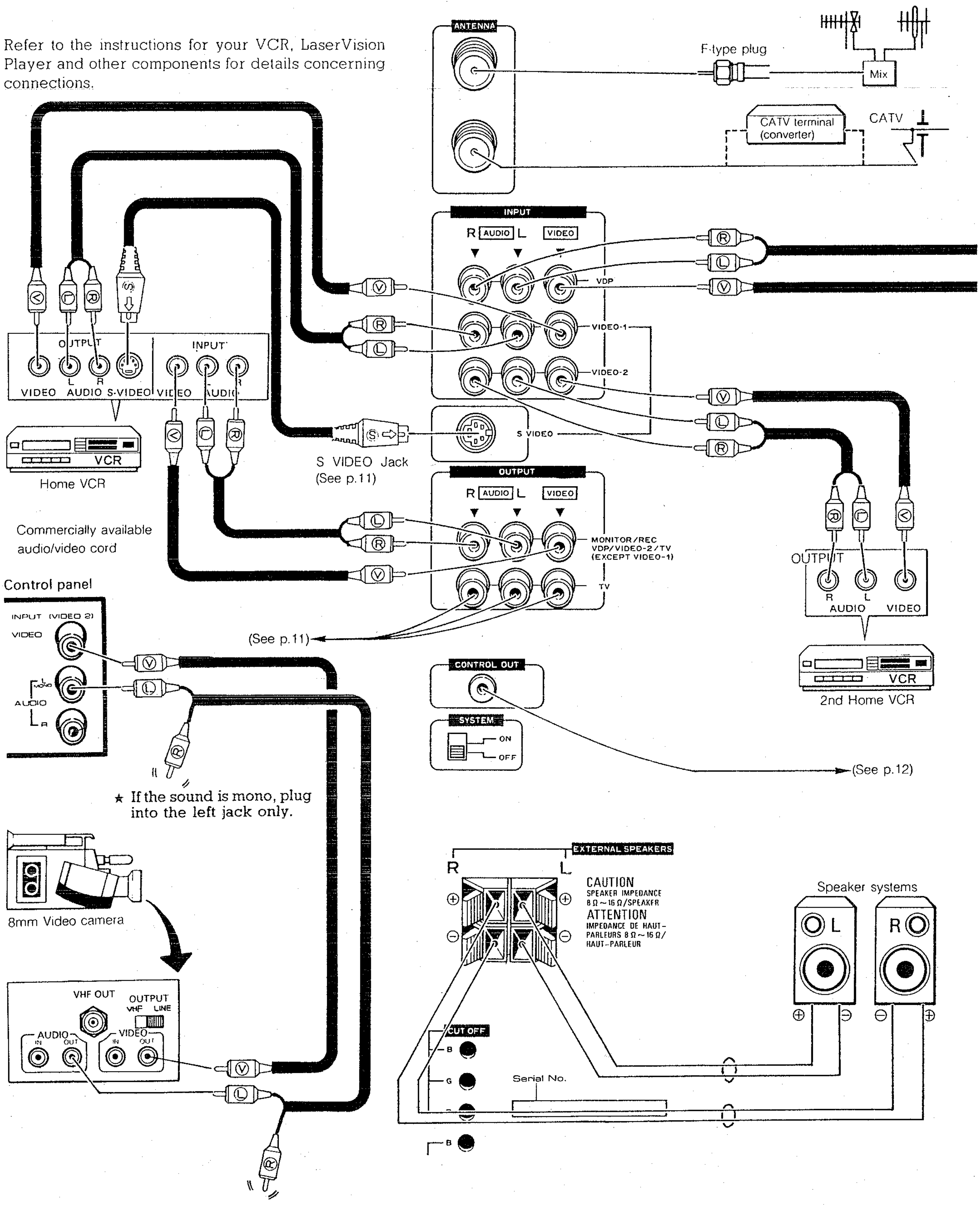
Illuminates when DPO is on.

NOTE:

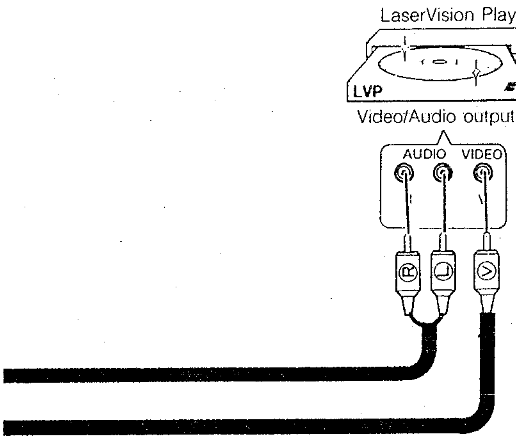
- *Very occasionally, an electrical discharge may occur inside the CRT. It makes a short, sharp pop and results in a 1- or 2-second power failure. The power will return automatically. You need not worry about the discharge for it is not a defect. It will disappear with regular use.*

SYSTEM CONNECTION DIAGRAM

Refer to the instructions for your VCR, LaserVision Player and other components for details concerning connections.

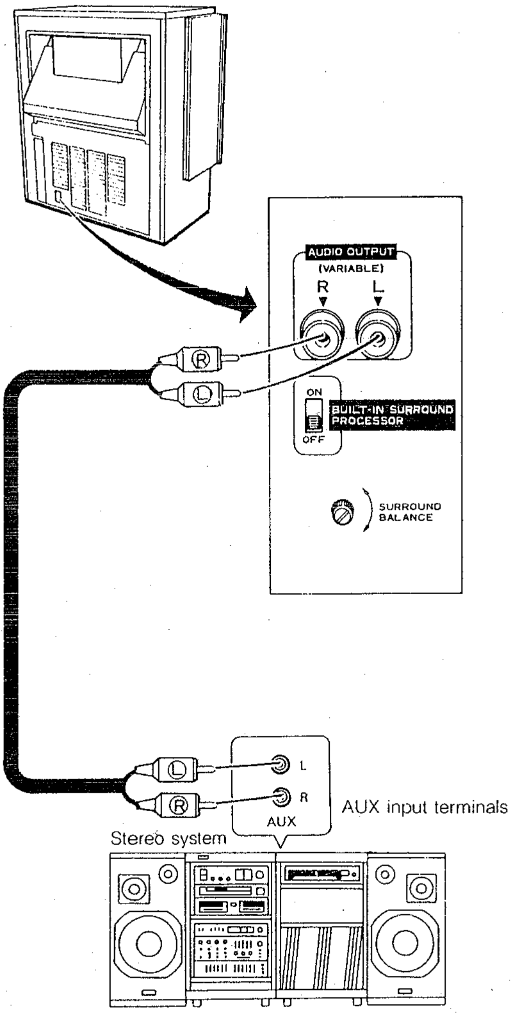

UHF
VHF
ANTENNA
F-type plug
Mix
CATV terminal (converter)
CATV
INPUT
R AUDIO L
VIDEO
VDP
VIDEO-1
VIDEO-2
S VIDEO
OUTPUT
INPUT
VIDEO
AUDIO
S-VIDEO
L
R
VCR
Home VCR
Commercially available audio/video cord
S VIDEO Jack (See p.11)
OUTPUT
R AUDIO L
VIDEO
MONITOR/REC VDP/VIDEO-2/TV (EXCEPT VIDEO-1)
TV
(See p.11)
OUTPUT
R
L
AUDIO
VIDEO
VCR
2nd Home VCR
Control panel
INPUT (VIDEO 2)
VIDEO
L MONO
AUDIO
R
CONTROL OUT
SYSTEM
ON
OFF
(See p.12)
★ If the sound is mono, plug into the left jack only.
8mm Video camera
VHF OUT
OUTPUT
VHF LINE
AUDIO
IN
OUT
VIDEO
IN
OUT
EXTERNAL SPEAKERS
R
L
CAUTION
SPEAKER IMPEDANCE 8 Ω ~ 16 Ω/SPEAKER
ATTENTION
IMPEDANCE DE HAUT-PARLEURS 8 Ω ~ 16 Ω/HAUT-PARLEUR
Speaker systems
L
R
CUT OFF
B
G
R
B
Serial No.

SYSTEM CONNECTION DIAGRAM



Connections for listening to Projection Monitor sound on a stereo system.

★ Turn off the surround sound switch for this configuration.



INPUT JACKS

These are two sets of inputs for VCRs, LaserVision players, and other video sources. Use RCA-type pin plug cords (same as in hi-fi systems) for connections.

MONITOR/REC OUTPUT JACKS

These are used for connecting a VCR for recording, or for linking to another monitor. These jacks provide the video and audio signals of the source currently selected by the INPUT SELECTOR.
If you have one VCR, connect these output jacks to your VCR's inputs. Connect the VCR's outputs to the monitor's VIDEO-1 inputs.

NOTE:

- *If a VCR is connected to the VCR2 input, then that VCR should not be connected to these outputs. The design of some VCRs causes an oscillation feedback loop in such situations.*

OUTPUT TV JACKS

These provide the video and audio signals from the currently selected TV channel.
(These do not provide the signals from sources connected to the input jacks.)

CONTROL OUT JACK

This jack is used to extend remote control to other PIONEER equipment bearing the SR (System Remote) mark.
Use mono miniplug cords (available at audio and video shops) to connect the monitor's CONTROL OUT jack to the CONTROL IN-jack of the other unit. The other unit can be connected to still another in the same manner, from the CONTROL OUT jack of one to the CONTROL IN jack of the other. If a unit has only a CONTROL IN jack then put that unit last in the sequence. Otherwise, you may connect in any order that is convenient.
If other equipment has the SR mark and its own remote control sensor, then the CONTROL OUT/IN jack connection is not required. However, this connection may improve the response of remote control, since you will not need to point the remote control unit at different components. (See page 12.)

AUDIO OUTPUT (VARIABLE) JACKS

These jacks provide the audio signal from the video program material currently selected for viewing on the monitor. Connect these audio output jacks to the AUX input jacks of your stereo system. You can then use the remote control unit to adjust the volume.

S VIDEO INPUT JACK

Use this jack for input of S-VHS or ED Beta VCR signals. (Connect the audio signal to the VIDEO-1 audio input jacks.)
The S VIDEO input jacks is given priority if there is also a connection to the standard VIDEO-1 input jack.

SYSTEM SWITCH

Used when connecting to some PIONEER amplifiers.
For details, refer to the "SYSTEM SWITCH" section on page 22.

EXTERNAL SPEAKERS TERMINALS (R, L)

For connection of external speakers (purchased separately).

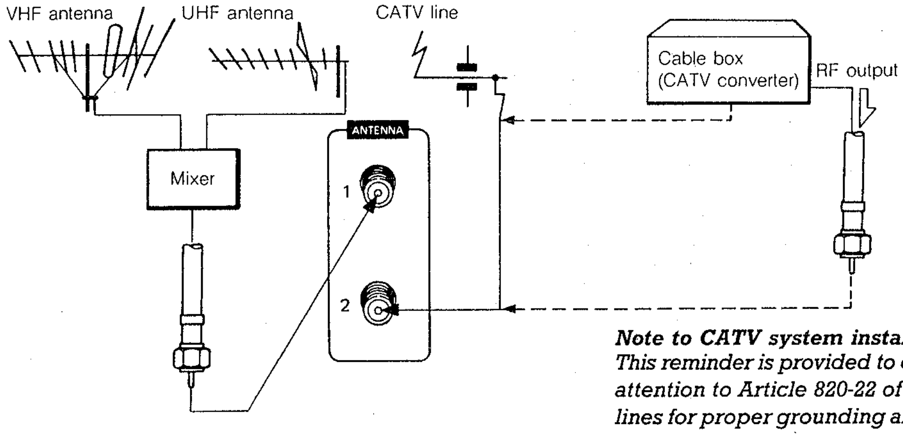
ANTENNA CONNECTIONS

A good color picture depends on a good TV signal. So does good multi-channel (stereo and SAP) sound. To assure the highest signal quality, choose an antenna that suits your reception area and have it properly installed. Ask your dealer for advice.
Of course, if you will be subscribing to cable or have a central antenna for your building, then you will not need an external antenna.
However, proper connections from your TV signal source to your monitor are essential. Please refer to the instructions below.

USING THE ANTENNA CABLE CONNECTOR

The cable connector plugs into one of the monitor's antenna terminals. This unit is designed to connect to a 75 ohm coaxial cable using an F-plug.

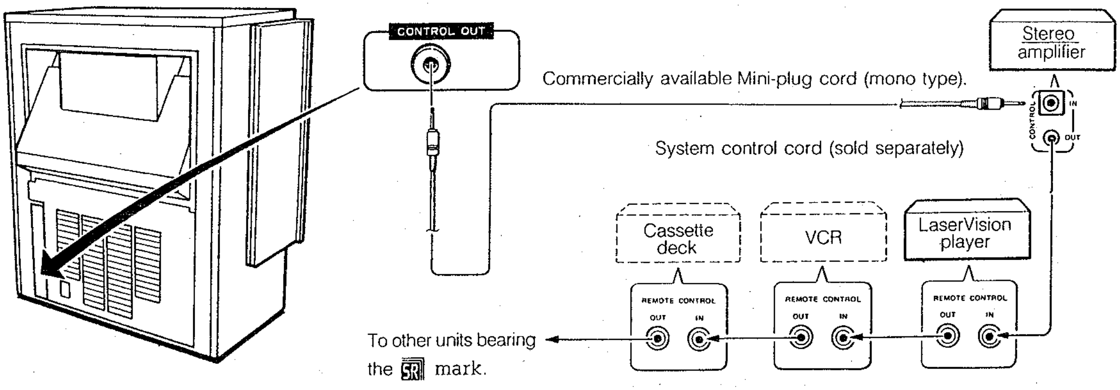
Plug the antenna cable connector into the ANTENNA 1 terminal. If you subscribe to cable, connect the cable box output to the ANTENNA 2 terminal.


VHF antenna
UHF antenna
CATV line
Cable box
(CATV converter)
RF output
Mixer
ANTENNA
1
2

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

SYSTEM REMOTE CONTROL CONNECTIONS

Many PIONEER audio and video components can be connected to allow remote control of an entire audio/video system. Use mini-plug cords (monaural) which may be purchased in most audio and video stores. Connect from the REMOTE CONTROL OUT jack of one unit to the IN jack of the next unit.

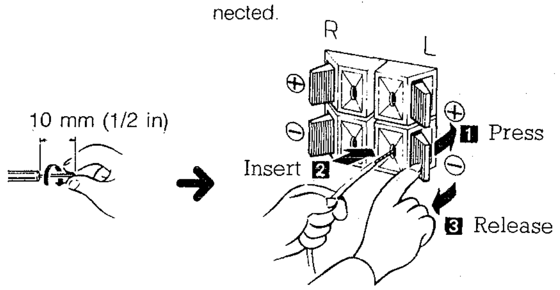

CONTROL OUT
Commercially available Mini-plug cord (mono type).
Stereo amplifier
CONTROL
IN
OUT
System control cord (sold separately)
Cassette deck
VCR
LaserVision player
REMOTE CONTROL
OUT
IN
To other units bearing the SR mark.

SPEAKERS

CONNECTING EXTERNAL SPEAKER WIRES

Strip each wire so that about half an inch is exposed. Twist the core.

Turn off power on the monitor and connected equipment.
Press lever, insert wire, and release lever to lock into place. Pull gently on the wire to check that it is securely connected.



Do this for each wire. Be careful to connect the right speaker's plus and minus terminal wires to the "R" "+" and "−" terminals. Likewise, connect the left speaker's plus and minus terminal wires to the "L" "+" and "−" terminals.

Precautions

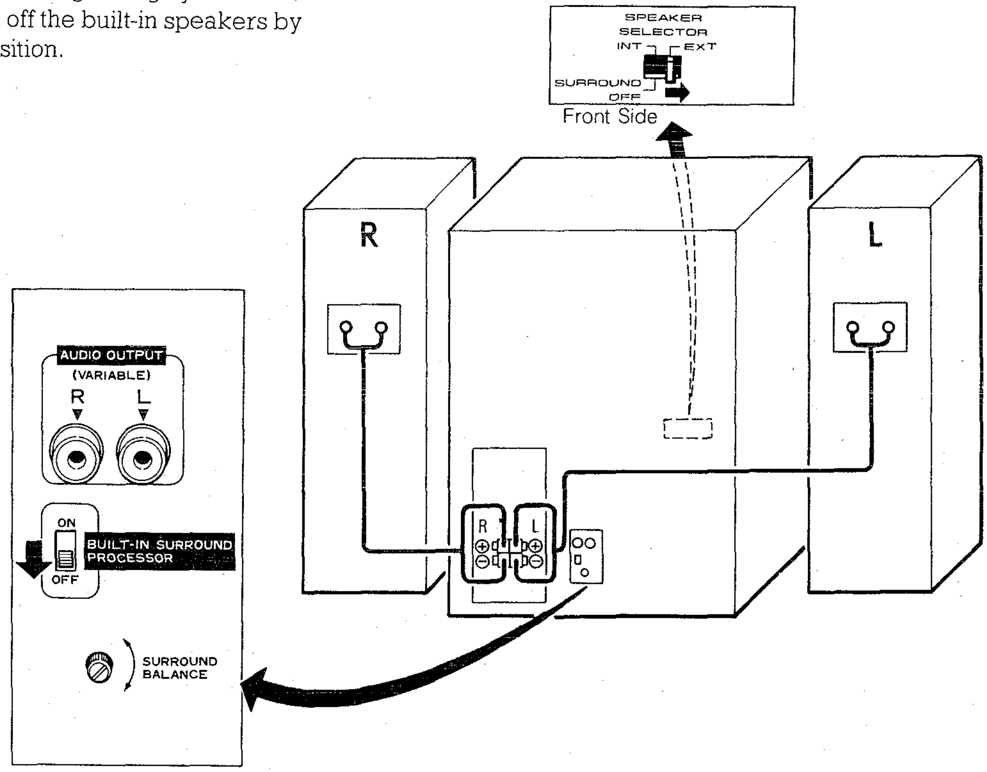
- Be sure that exposed wires do not protrude and touch each other.
- If you do not hear a normal stereo image when listening to a stereo program, it may be because the "+" and "−" connections are reversed for one of the external speakers.
- Be sure that the right speaker is connected to the "R" terminals and the left speaker to the "L" terminals. Be sure that each speaker's two wires are properly connected to the appropriate "+" and "−" terminals.

NOTES:

- *Use speakers having an impedance rating of from 8 ohms to 16 ohms. Speakers having less than 8 ohms impedance may draw excessive current, triggering the monitor's protection circuit. The protection circuit cuts off output to prevent damage in case of short circuits or abnormally low impedance.*
- *Ordinary speakers are not magnetically shielded and may disturb the picture if placed too close to the monitor. Move the speakers about two feet away from the monitor if you notice a problem.*

SPEAKER SELECTOR

Set this to the INT position if you will be listening to the built-in speakers. If you have connected external speakers (or if you will be listening through your stereo system), then you can turn off the built-in speakers by setting this to the EXT position.



★ Turn off the surround processor switch.

SURROUND SPEAKER SYSTEM

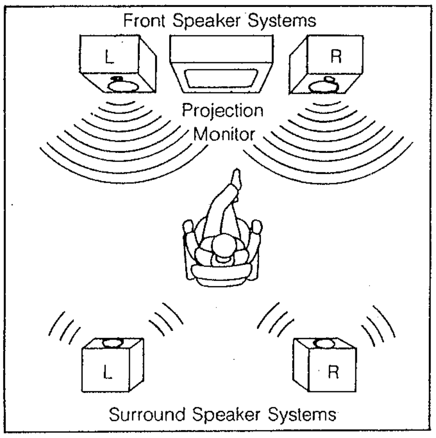
What is Surround Sound?

Ordinary stereo sound comes only from speakers in front of your listening position. However, in a concert hall or theater you also hear sound reflected off of walls, floor and ceiling. This reflected and reverberant sound gives the feeling of ambience or spaciousness of a live performance. Surround sound systems reproduce this additional sound information, creating a fuller, more "live" sound.

Speaker System Placement

The placement of the speakers in your system — their height, angles, and distances from walls — will have a great effect on the results that you hear. Speakers should be set slightly higher than your ear level when sitting at your viewing position.

Constructing a Surround System


Front Speaker Systems
L
R
Projection Monitor
L
R
Surround Speaker Systems

Surround System Layout

In this diagram you are looking at the system from in back of the monitor. (Therefore, the left and right speakers appear reversed.)

In this surround system connection, the rear surround speakers are connected to the speaker terminals on the rear of this unit. The front speakers are connected to a stereo amplifier which is connected to this unit's audio output jacks.

DOLBY SURROUND

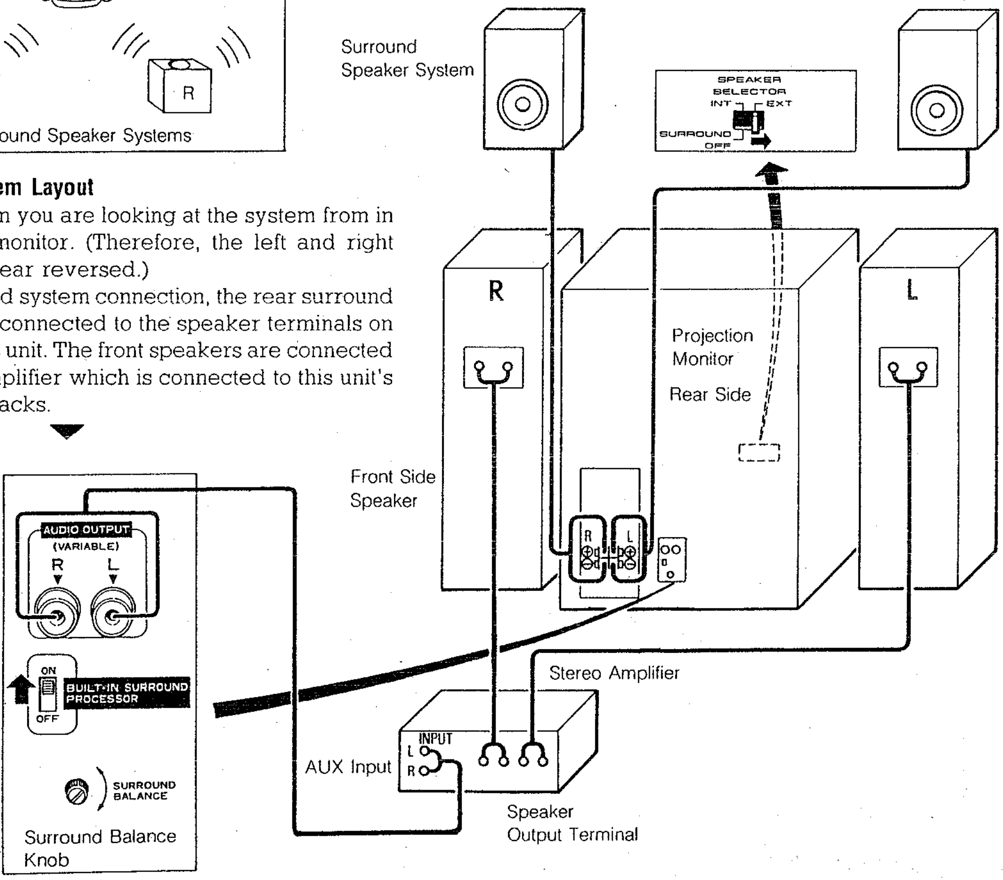
This Monitor is equipped with a built-in surround processor for Dolby Surround encoded movies and other program material. With an external stereo system and surround speakers you can enjoy the exciting realism of Dolby Surround. Make connections as shown on this page, turn on the rear panel surround processor switch and set the front panel speaker selector to EXT.

NOTE:

The built-in surround processor is most effective with recent movies and other stereo material that is Dolby Surround encoded. It will also produce rear speaker output with ordinary stereo sources. Rear output will not normally be heard with mono sources.

Surround Balance Adjustment

Play a Dolby Surround encoded videotape or VideoDisc. Adjust the rear panel surround balance knob so that during movie dialog you hear minimum sound from the rear surround speakers. Main dialog should seem to come from the monitor screen. When you see actors talk on the screen, their voices usually should appear to come from the screen area, not from the side and rear.


Surround Speaker System
SPEAKER SELECTOR
INT
EXT
SURROUND
OFF
R
L
Projection Monitor
Rear Side
Front Side Speaker
AUDIO OUTPUT
(VARIABLE)
R
L
ON
BUILT-IN SURROUND PROCESSOR
OFF
SURROUND BALANCE
Surround Balance Knob
Stereo Amplifier
INPUT
L
R
AUX Input
Speaker Output Terminal

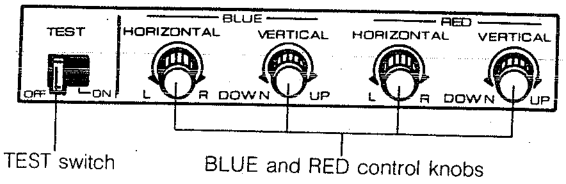
HOW TO ALIGN COLOR CONVERGENCE

This Projection Monitor uses three separate TV tubes. There is a red tube, a green tube, and a blue tube. The red, green and blue images are projected onto the screen where they converge to form a full color picture. If they do not converge correctly, then you see colored borders around the images.

Your dealer should adjust the color convergence when your set is delivered. However, convergence may drift over time or if you move the set.

Follow the steps below if color convergence alignment is needed.

1. Turn on the power and select an active channel. Wait a moment for the picture to stabilize.
2. Turn on the TEST switch on the control panel. If convergence is correct then there will be one vertical and one horizontal white line, as in figure 1.
3. If you see separate colored lines, then adjust the BLUE and RED control knobs marked HORIZONTAL and VERTICAL. Turn the knobs so that the red and blue lines disappear into the other lines. Convergence is correct when all three colors (red, green, and blue) converge, producing single white lines.
4. Turn off the TEST switch when convergence is correct.


TEST
BLUE
HORIZONTAL
VERTICAL
RED
HORIZONTAL
VERTICAL
OFF
ON
L
R
DOWN
UP
L
R
DOWN
UP
TEST switch
BLUE and RED control knobs

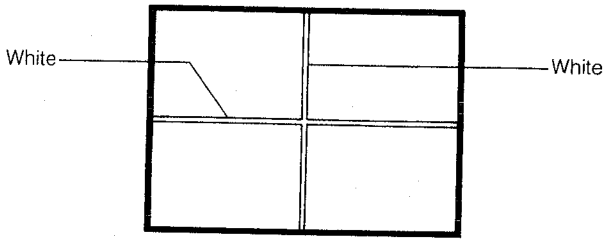

White
White

Fig. 1 Correctly aligned

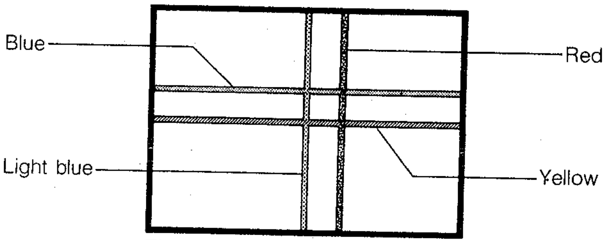

Blue
Red
Light blue
Yellow

Fig. 2 Horizontal and vertical misaligned

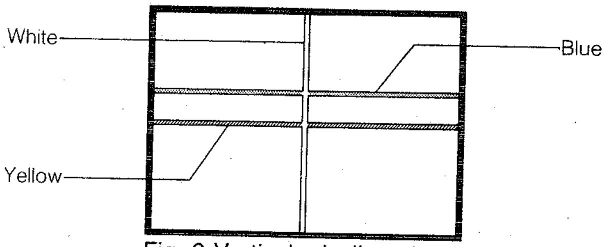

White
Blue
Yellow

Fig. 3 Vertical misaligned

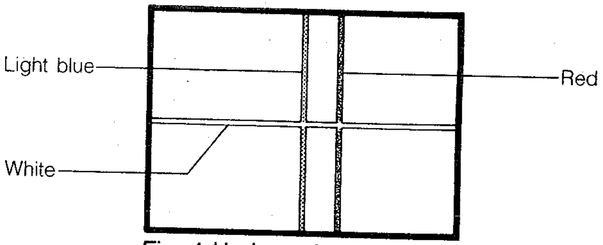
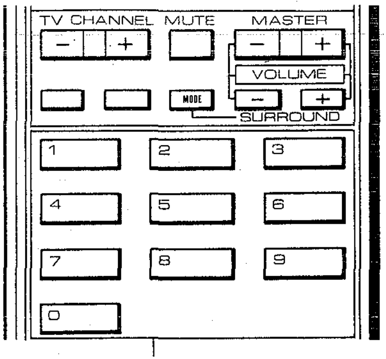

Light blue
Red
White

Fig. 4 Horizontal misaligned

TV CHANNEL SELECTION

The Projection Monitor uses a frequency synthesizer tuning system to permit reception of up to 125 channels (including cable channels). This electronic tuning system gives you two ways of selecting channels. You can use the remote control keys numbered "0" through "9" to directly input the channel number.
Or you can use the two TV CHANNEL keys marked " – " and " + " to check one channel after another. In this case you can remove or add channels so that "CHANNEL MEMORY" contains only those channels that you usually watch.
The 125 possible channels include broadcast TV channels 2-13 (VHF), 14-69 (UHF), as well as cable (CATV) channels 1-13 (VHF), 14-22 (mid-band), 23-36 (super-band), 37-65 (hyper-band), and 94-99 (mid-band).

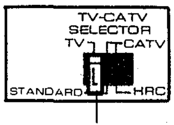
NOTE:
- *CHANNEL MEMORY refers to channel access by pressing the CHANNEL keys marked "+" and "–". You can specify which channels are to be included in CHANNEL MEMORY before using this function. Details follow.*



Channel call 10 keys

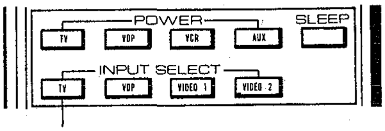
BROADCAST TV CHANNEL SELECTION

1. **Set the TV-CATV SELECTOR to the "TV" position. This selector is behind the control panel door on the front panel.**



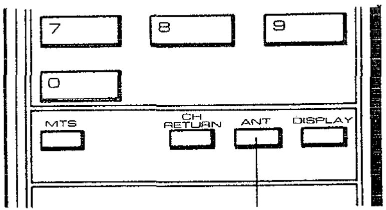
"TV" position

2. **Press the TV input selector key on the remote control.**



Press

3. **Press the Antenna (ANT) selector key on the remote so that "ANTENNA-1" appears on the monitor screen.** (This is assuming that your antenna is connected to the ANTENNA 1 terminal on the rear panel.)



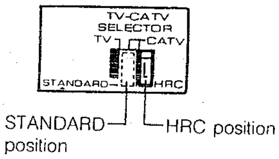
Press

4. **Select channels directly by pressing the channel number on the remote control "CHANNEL CALL" 10-key pad.** For example, to receive channel "23," press 2 and then 3. For channels 2 through 9, first press zero, then the number. Or just press the number and wait for about four seconds.
   (While waiting for you to input a second digit, the first digit blinks. If you do not input a second digit within four seconds, then the first digit is selected as the channel number.)

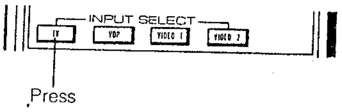
5. **Channel memory selection is also possible.** Using the CHANNEL keys marked "+" and "–" you can scan through the channels which are in channel memory. To add or delete channels in memory, see CHANNEL MEMORY SETTING on page 19.

TV CHANNEL SELECTION

CABLE (CATV) CHANNEL SELECTION



1. Set the TV-CATV SELECTOR to the "CATV STANDARD" or "HRC" position. (Ask your dealer or cable service provider which is correct for your local CATV system.) This selector is behind the control panel door on the front panel.
2. **Press the TV input selector key on the remote.**
3. **Press the Antenna (ANT) selector key on the remote so that "ANTENNA-2" appears on the monitor screen.** (This is assuming that your cable converter box is connected to the ANTENNA 2 terminal on the rear panel.)
4. **Select channels directly by pressing the channel number on the remote control 10-key pad.** For example, to receive channel "23," press the 2 and then 3. For channels 1 through 9, first press zero, then the number. Or just press the number and wait for about four seconds. Note that channel numbers "00," and "66" through "93" are not assigned. So the selected channel will not change if you input these numbers.
   You can select VHF channels (1-13), mid-band channels (A1-A6, A-I), super-band channels (J-W), and hyper-band channels (AA-CCC). Refer to the standard cable channel assignment table shown here. Your local service provider's channel assignments may differ from those shown in the table.
5. **Channel memory selection is also possible.** Using the CHANNEL keys marked "+" and "–" you can scan through the channels in channel memory. To add or delete channels in memory, see CHANNEL MEMORY SETTING on page 19.



CABLE (CATV) CHANNEL ASSIGNMENT TABLE

Channel number assignment for the cable tuning mode begins with 01 through 65, omits the unassigned numbers 66 through 93, then proceeds from 94 through 99. The specific channel number assignments and the corresponding alphabetical designation are shown below in the channel table.

	VHF L	MID		VHF H	SUPER		HYPER			UHF
TV	2 ~ 6	—		7 ~ 13	—		—			14 ~ 69
CATV	2 ~ 6 (STD) 1 ~ 6 (HRC)	A-6 (94)	A (14)	7 ~ 13	J (23)	Q (30)	AA (37)	KK (47)	TT (56)	—
		A-5 (95)	B (15)		K (24)	R (31)	BB (38)	LL (48)	UU (57)	
		A-4 (96)	C (16)		L (25)	S (32)	CC (39)	MM (49)	VV (58)	
		A-3 (97)	D (17)		M(26)	T (33)	DD (40)	NN (50)	WW (59)	
		A-2 (98)	E (18)		N(27)	U (34)	EE (41)	OO (51)	XX (60)	
		A-1 (99)	F (19)		O(28)	V (35)	FF (42)	PP (52)	YY (61)	
			G (20)		P (29)	W(36)	GG (43)	QQ (53)	ZZ (62)	
			H (21)				HH (44)	RR (54)	AAA(63)	
			I (22)				II (45)	SS (55)	BBB (64)	
							JJ (46)		CCC(65)	

For example: Channel number "14" corresponds with mid-band cable channel "A".

NOTE:

- *Cable (CATV) services can vary from area to area. The channel number assignments shown in the channel table may not correspond with the channel numbers used by your local cable company. Direct tuning to cable channels without the use or the cable company "converter" or "preselector" will depend on the specific channels in use by the cable company. Direct tuning to cable channels is limited to unencoded (unscrambled) channels only. Check your local cable company compatibility requirements.*

MULTI-CHANNEL TV SOUND (MTS)

A multi-channel TV sound decoder is built into the Projection Monitor.
This MTS decoder permits stereo and SAP sound reception. (SAP is a "second audio program" often used for a second language.) The MTS decoder is only effective if the broadcast includes stereo or SAP signals. For regular (mono) sound signals you can simulate a stereo effect by turning on the SIMULATED STEREO switch.
LED indicators on the front panel confirm STEREO, SAP, and MONO modes.

NOTE:

- ***Broadcast stereo and SAP reception operate in accordance with the Broadcast Television Systems Committee (BTSC) stardard only. Stereo audio transmission from CATV (Cable television) systems can vary from area to area and may not be compatible with the BTSC standard.***
  Check with your local cable company for specific compatibility requirements.

STEREO RECEPTION

If necessary, use the remote control MTS key to switch to the MAIN setting. The set will switch automatically between mono and stereo according to the signals received.

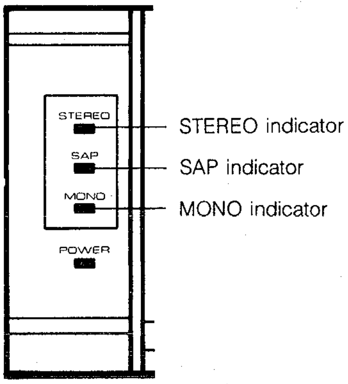
SAP (SECOND AUDIO PROGRAM) RECEPTION

TV stations have the option of broadcasting a second audio program (SAP) signal. This additional sound channel accompanies another mono signal or stereo signal. However, the SAP sound itself is in mono.

Use the MTS key to switch to the SAP or MAIN/SAP setting if you wish to hear "second audio program" sound. (At the MAIN/SAP setting, the SAP sound will come from the right stereo speaker while the left speaker produces the main sound signal.)
You will still hear stereo or mono sound when there is no SAP signal.

MONO RECEPTION

You can force monophonic reproduction of all programs by using the MTS key to select MONO.

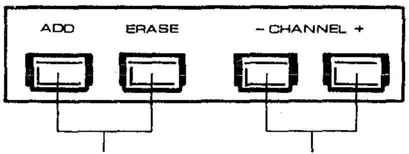


Audio Reception Mode Display (selected by the MTS key)

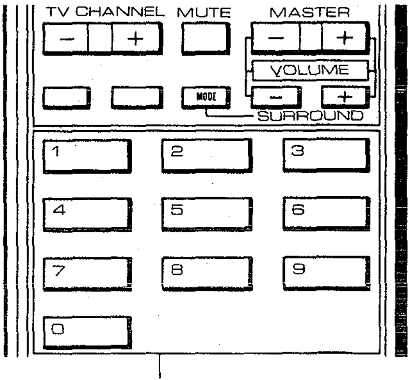
Broadcasted mode / Mode selected		MONO	STEREO	MONO + SAP	STEREO + SAP
MAIN	Display	TV ○ ○ MAIN	TV ○ ○ MAIN	TV ○ ○ MAIN	TV ○ ○ MAIN
	REPRODUCTION Mode	MONO	L, R	MAIN (MONO)	L, R
SAP	Display	TV ○ ○ SAP	TV ○ ○ SAP	TV ○ ○ SAP	TV ○ ○ SAP
	REPRODUCTION Mode	MONO	L, R	SAP	SAP
MAIN/SAP	Display	TV ○ ○ MAIN/SAP	TV ○ ○ MAIN/SAP	TV ○ ○ MAIN/SAP	TV ○ ○ MAIN/SAP
	REPRODUCTION Mode	MONO	L, R	L. MAIN (MONO) R. SAP	L. MAIN (MONO) R. SAP
MONO	Display	TV ○ ○ MONO	TV ○ ○ MONO	TV ○ ○ MONO	TV ○ ○ MONO
	REPRODUCTION Mode	MONO	MONO	MONO	MONO

CHANNEL MEMORY

You can customize this special tuning system so that it will select only your personal choice of channels. When the Projection Monitor leaves the factory, all possible channels are in CHANNEL MEMORY.
You can delete channels from CHANNEL MEMORY by tuning them in and then pressing the ERASE key. You can add channels to CHANNEL MEMORY by using the 10-key pad to tune them in and then pressing the ADD key.
Press the CHANNEL keys marked "+" and "−" to scan through the channels that are currently in CHANNEL MEMORY.



ADD, ERASE keys Channel (memory) selector keys



Channel call 10 keys

CHANNEL MEMORY SETTING

Channel memory is intended for you to set to match your personal preferences among the channels available in your area. Please refer to your local TV or cable program guide. Follow the procedures below to customize channel memory to your requirements.

Removing Channels from Channel Memory

1. Use the CHANNEL "+" or "−" key to tune in the channel that you wish to delete from channel memory.
2. Press the ERASE key.
3. Repeat the above steps to delete additional undesired channels.
You are free to add and delete channels as you like.

Putting Channels into Channel Memory

1. Turn on the monitor. (If necessary, open the control panel door and set the TV-CATV selector to the TV or CATV [STD or HRC] position, as appropriate.)
2. Select a channel by pressing the number keys on the remote control.
3. Press the ADD key to put the currently selected channel into memory.
4. Now you can recall your desired channels by pressing the CHANNEL "+" and "−" keys.

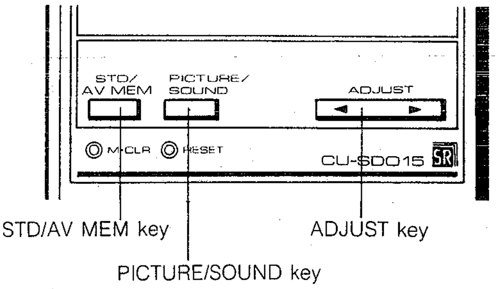
OTHER MEMORY FEATURES

The Projection Monitor also remembers many other settings related to day-to-day operation. So when you turn the set on, it comes up with your previous channel and volume settings. It also remembers your previous picture quality settings.

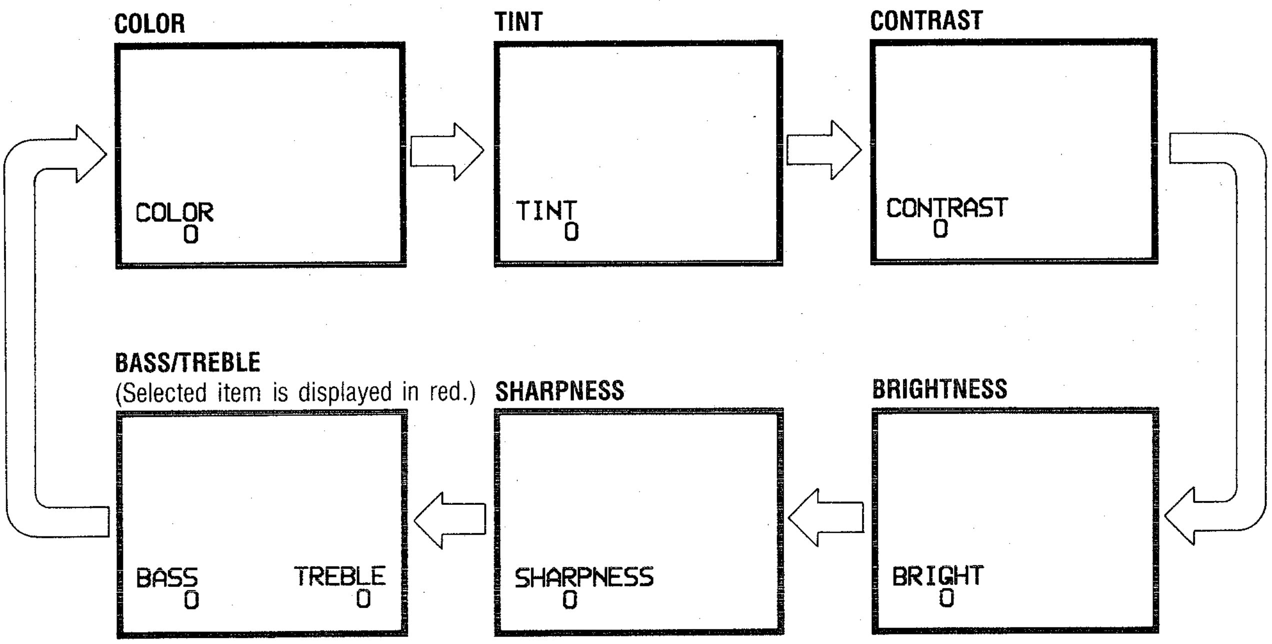
PICTURE AND TONE ADJUSTMENT

On the remote control is a PICTURE/SOUND key. Each time you press this key, the screen will show a different item for you to adjust. These items are color, tint, contrast, brightness, sharpness, and bass & treble. To adjust the item shown on the screen, you press either side of the key marked ADJUST. Press the right side to raise the value of the item. Press the left side to lower it. Set each item to any value that you like; the current value is shown on the screen.
To return to the standard settings made at the factory, simply press the STD/AV MEM key on the remote, so that the screen shows STD.

NOTE:
- *The Projection Monitor has been adjusted before shipping. Please make additional adjustments to suit your personal taste.*


STD/
AV MEM
PICTURE/
SOUND
ADJUST
M-CLR
RESET
CU-SD015
SR
STD/AV MEM key
ADJUST key
PICTURE/SOUND key

SCREEN INDICATIONS FOR PICTURE AND SOUND ADJUSTMENT

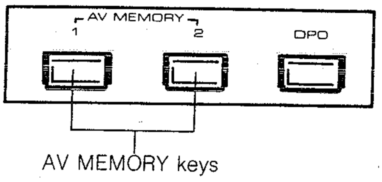

COLOR
TINT
CONTRAST
COLOR
0
TINT
0
CONTRAST
0
BASS/TREBLE
SHARPNESS
BRIGHTNESS
BASS
0
TREBLE
0
SHARPNESS
0
BRIGHT
0

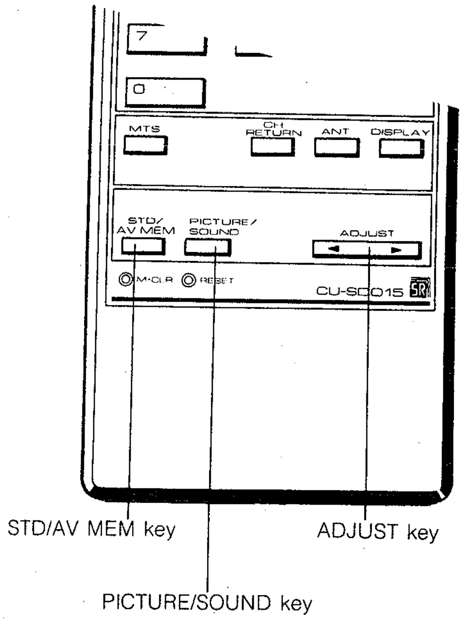
(Selected item is displayed in red.)

NOTE:
- *If the color seems wrong but can not be fixed by color or tint adjustment, then you may need to align the color convergence (See page 15).*

AV MEMORY

After making adjustments, you can store your picture and tone quality settings in the AV MEMORY presets. Follow the procedure below.





Storing a Setting

1. Watch a TV show, video tape, or video disc.
2. Adjust the picture and tone by using the PICTURE/SOUND key and the ADJUST key.
3. Press one of the two AV MEMORY keys while holding down both the volume + and − keys on the control panel.

Upon completion of memory storage, AV MEMORY 1 or 2 will be displayed momentarily.

Recalling a Setting

Press the STD/AV MEM key on the remote control unit. Each press of the STD/AV MEM key moves the selection from STD to AV MEMORY 1, to AV MEMORY 2 and then back around to STD again. (Press the key while the previous legend is still on the screen. Otherwise, it will return to the STD setting.)

Returning to the Standard Setting

Press the STD/AV MEM key so that the screen shows STD.

NOTE:

- ***AV Memory settings do not affect the signals sent out from the Projection Monitor's output jacks.***

DPO ADJUSTMENT

When the DPO switch is on, the monitor automatically adjusts the contrast, brightness and color to match room lighting conditions. This is done according to factory preset specifications which ordinarily do not need to be changed. However, if the DPO is giving you too bright a picture under dim lighting conditions, you can change its response by following these directions.

1. Under dim room lighting, watch a TV show, video tape, or video disc.
2. Use the PICTURE/SOUND key and the ADJUST key to adjust the color, contrast, and brightness.
3. Press the DPO switch while holding down both the volume + and − keys on the control panel. (DPO will be turned off by this procedure.)

Upon completion of adjustment, DPO ADJ will be displayed momentarily.
Now when DPO is on, it will reproduce your setting under dim lighting conditions.

SYSTEM SWITCH

This switch is important only if you will be using the Projection Monitor as a video display monitor for a PIONEER audio/video system.

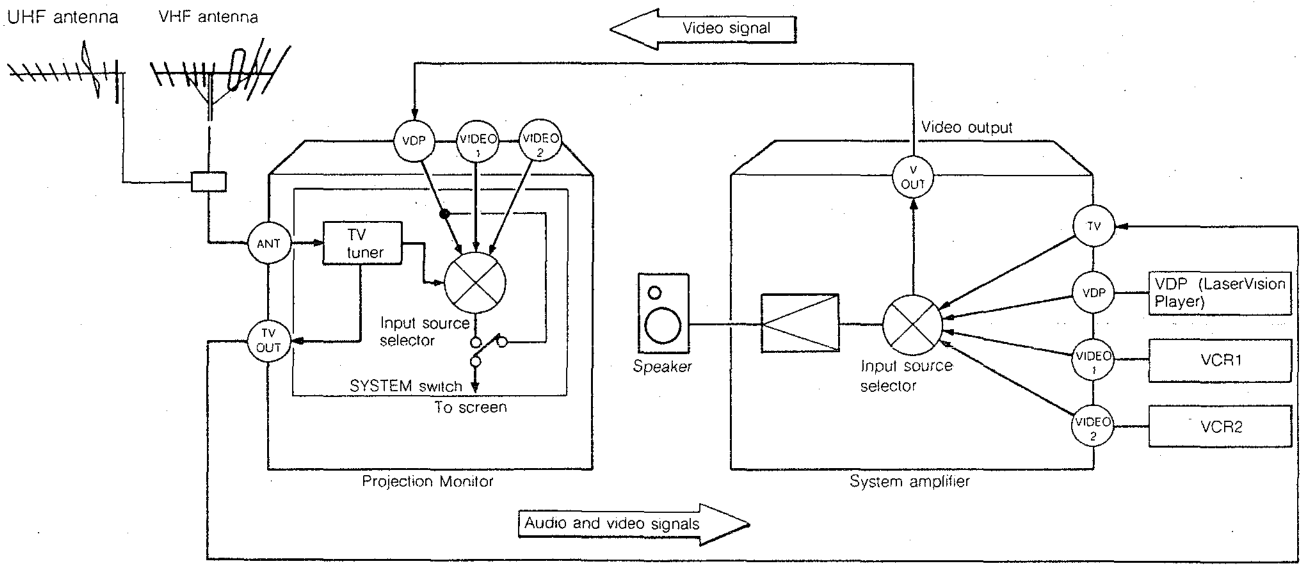
Connection to a PIONEER System Amplifier

1. Turn on the Projection Monitor's SYSTEM switch (on the rear panel).
2. Connect the Projection Monitor's TV OUTPUT jacks to the TV INPUT jacks of the amplifier. (Use the supplied video and audio cords or standard RCA stereo pin plug cords for this purpose.)
3. Connect the amplifier's VIDEO OUTPUT jacks to the Projection Monitor's VDP INPUT jacks.

Using the System

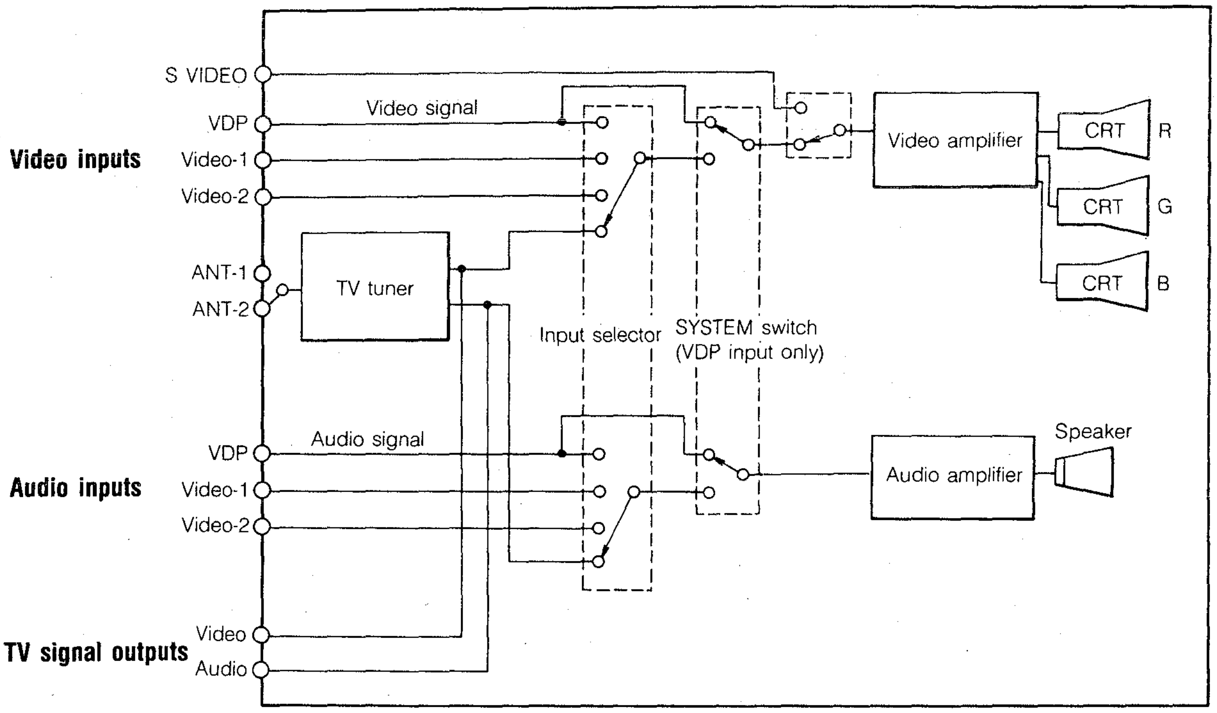
1. Use the Projection Monitor's remote control to select TV as the input source.
2. Select your desired video source on the amplifier.
3. The TV screen will continue to give you information about your Projection Monitor settings including channel and antenna selection. It will not confirm MTS (main, stereo, SAP, etc.) modes, though they are still effective.
(TV/CABLE settings are also effective but snow will appear on the screen if an empty channel is selected. Audio muting remains effective.)

Antenna or Cable Signal


UHF antenna
VHF antenna
Video signal
VDP
VIDEO 1
VIDEO 2
ANT
TV tuner
TV OUT
Input source selector
SYSTEM switch
To screen
Projection Monitor
Speaker
Video output
V OUT
Input source selector
System amplifier
TV
VDP
VIDEO 1
VIDEO 2
VDP (LaserVision Player)
VCR1
VCR2
Audio and video signals

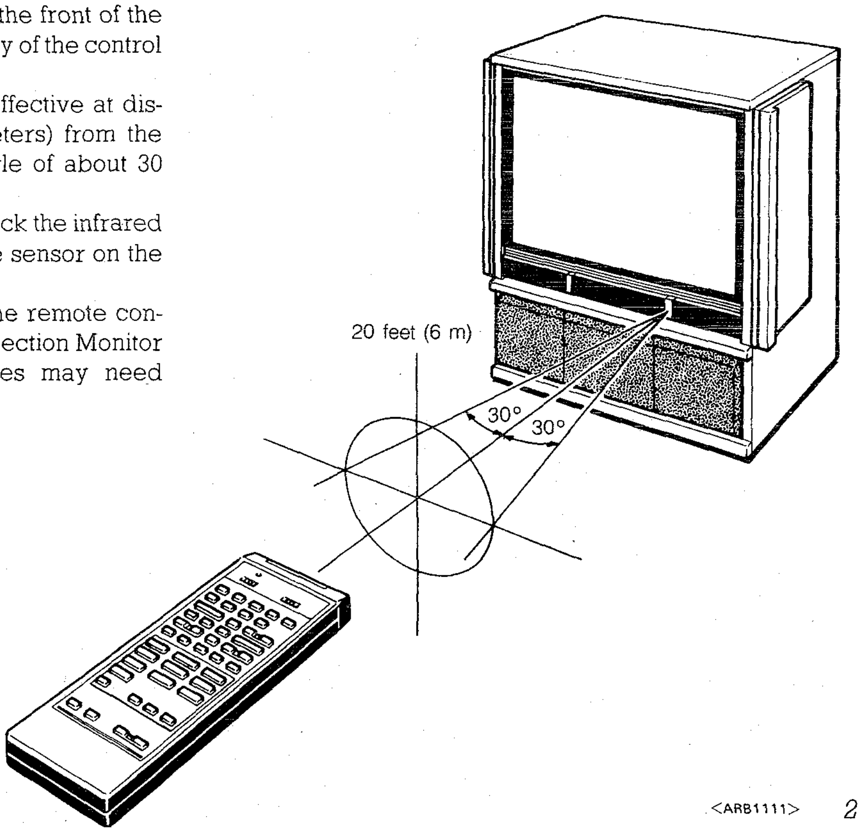
Use the supplied accessory video/audio cords for connections.

BLOCK DIAGRAM


Video inputs
S VIDEO
VDP
Video-1
Video-2
ANT-1
ANT-2
TV tuner
Video signal
Input selector
SYSTEM switch (VDP input only)
Video amplifier
CRT
R
CRT
G
CRT
B
Audio inputs
VDP
Video-1
Video-2
Audio signal
Audio amplifier
Speaker
TV signal outputs
Video
Audio

REMOTE CONTROL OPERATION RANGE

- Point the remote control unit toward the front of the Projection Monitor when you press any of the control keys.
- The remote control unit should be effective at distances of up to about 20 feet (6 meters) from the Projection Monitor and over an angle of about 30 degrees from the front panel.
- Furniture and other obstacles may block the infrared light beam so that it cannot reach the sensor on the Projection monitor's front panel.
- If there is no response even when the remote control is used directly in front of the Projection Monitor then the Alkaline dry cell batteries may need replacement. (See page 7.)


20 feet (6 m)
30°
30°

TROUBLESHOOTING

Please check the following chart and try the suggested solutions before consulting a PIONEER authorized service center.

Often you can fix the problem by making a simple adjustment on the Projection Monitor. Faulty connections may be to blame. Or it may be another piece of equipment that is causing the trouble.

SYMPTOM	POSSIBLE CAUSE AND SUGGESTED SOLUTION
NO PICTURE	AC power cord is not plugged into the wall socket. **Plug in AC power cord.** Power switch is off. **Turn on power switch on the Projection Monitor. Or turn on power switch on remote control unit.** Selected video signal source is not connected to input jacks or source unit (VCR, etc.) is not turned on or not providing a signal. **Check connections and source unit operation. Switch off SYSTEM switch.**
COLOR IS WASHED OUT	Color value is too low. **Use PICTURE/SOUND key and ADJUST key to increase COLOR value.** Brightness value is too high. **Use PICTURE/SOUND key and ADJUST key to reduce BRIGHT value.**
COLOR TINT IS WRONG	Tint value is too high or low. **Use PICTURE/SOUND key and ADJUST key to adjust TINT value.**
STATIC IN TV PICTURE	Interference from motor vehicles, neon signs, etc. **Try changing the height or direction of the TV antenna. Move the antenna away from the source of interference.**
GHOSTING ON SCREEN	This "multipath" distortion is caused when the TV signal is received along two paths, directly and after being reflected from tall buildings, mountains or other obstacles. Strong winds may have changed the direction of the TV antenna. **Try changing the height or direction of the antenna. An antenna with better directional characteristics may be required.**
COLORED STRIPES ON SCREEN	Interference from other radio or TV signals. **Try changing the height or direction of the antenna. Try changing to a coaxial antenna cable. Coaxial cable is shielded to minimize pickup of interfering signals.**
COLORED EDGES ON IMAGES	Color convergence needs adjustment. **Tune in a channel, turn on the TEST switch, and adjust by using the BLUE and RED convergence controls on the control panel. (See page 15 for details.)**
UNCLEAR PICTURE	Connections are loose or cables are damaged. **Check connections and try using new cables.** Antenna may be damaged. **Check antenna.**
POOR PICTURE OR COLOR QUALITY	Interference from a nearby speaker or other source of magnetism. **Move source of interference away from the monitor.**
NO SOUND	Front panel SPEAKER SELECTOR is set to EXT, but external speakers are not connected. **Set selector to INT.**
NO ON-SCREEN CHANNEL OR OTHER DISPLAY; SLEEP TIMER DOESN'T OPERATE	Strong light striking the remote control sensor may cause the internal microcomputer to malfunction. **Change the position of the Projection Monitor or the change the lighting so that the sensor is not exposed to strong light sources.**
NO SOUND FROM SURROUND SPEAKERS	Rear panel surround processor switch is off. **Turn on the surround processor switch.**

CARE OF YOUR PROJECTION MONITOR

DO NOT:

- Do not use strong cleansers, solvents, polishes, or chemically treated cloths to clean the screen or cabinet.
- Do not touch or scratch the screen.
- Do not fasten or place rubber or vinyl items on the monitor.
- Do not use tape on the monitor.

DO:

- Use a soft cloth to dust the screen and cabinet.
- If necessary, unplug the monitor and wipe with a soft cloth moistened with warm water (and mild soap if dirt has built up). Dry with a soft, dry cloth.
- Treat the screen with care to avoid scratches or damage.
- Ask your local dealer to clean the interior of the monitor if maximum picture brightness decreases. This may be caused by dust build-up inside.

SPECIFICATIONS

DISPLAY SECTION

Reception system .... American TV standard NTSC color
Screen size .... 45″ (SD-P452)
50″ (SD-P502)
CRT .... 7″ CRT x 3
Brightness (White peak) .... 350 foot-Lambert
[100% Window signal input (SD-P452)
contrast, bright Max.] 300 foot-lambert (SD-P502)
Actual viewing angle .... Horizontal H = 120°
Vertical V = 50°
Horizontal resolution .... 650 lines (SD-P452)
[Input digital test pattern 700 lines (SD-P502)
(900 lines resolution)]
Input terminals .... 3 video input systems,
S (VIDEO) input Jack (Y/C separate INPUT) x 1
3 audio input systems
Output terminals .... Video output (recording),
TV output, audio output,
System remote control terminals .... OUT
Input signal .... Video signal: 1.0Vp-p ±0.2V
(75 ohms load)
Audio signal: 500mVrms
Input impedance .... Video input: 75 ohms ±10%
Audio input: 50 k ohms or more
Input signal polarity .... Synchronized negative
Output terminal signal ratings:
Output terminals (except VIDEO 1) ....
Video signal: 1Vp-p (75 ohms load)
Audio signal: 500mVrms (100% modulation)
TV output terminal Video signal: 1Vp-p (75 ohms load)
Audio signal: 500mVrms (100% modulation)
Output impedance .... Video input: 75 ohms ±10%
Audio input: 15 kohms or more
Audio output terminal .... Audio signal: 630mVrms
(VARIABLE) (100% modulation
Volume MAX.)

TUNER SECTION

Circuit type .... Video signal detection:
PLL full synchronous detection
PLL Digital Synthesizer system
Audio multiplex: BTSC system
Reception channels ....
VHF; CH2 ~ CH13, UHF; CH14 ~ CH69
CATV (STANDARD or HRC switchable)
CATV A-6 CH ~ CCC (W+29) CH
Antenna terminals ....
ANTENNA 1, 2 terminal, 75 ohms UNBAL, F-type connector
(VHF, UHF MIXED)

AMPLIFIER SECTION

Effective output (both channels driven)
10W + 10W (THD. 1% 50Hz to 15,000Hz, 8 ohms)
Tone control: BASS .... +8dB, –10dB (100Hz)
TREBLE .... +8dB, –10dB (10kHz)
Built-in speaker system.. 16cm (6-1/2in) full range type x 2
Speaker terminals ....
Also used for surround (rear) speaker connection.
External speaker impedance .... 8 ~ 16 ohms

ELECTRICAL SECTION, MISCELLANEOUS

Power requirements .... AC 120V, 60Hz
Power consumption 275W
External dimensions ....
SD-P452 (model with doors) ....
1070(W) x 1275(H) x 652(D) mm
42-1/8(W) x 50-3/16(H) x 25-11/16(D) inches
SD-P452 (model without door) ....
1070(W) x 1255(H) x 629(D) mm
42-1/8(W) x 40-13/32(H) x 24-3/4(D) inch
SD-P502 (model with doors) ....
1171(W) x 1354(H) x 682(D) mm
46-1/8(W) x 53-5/16(H) x 26-13/16(D) inches
SD-P502 (model without door) ....
1171(W) x 1334(H) x 659(D) mm
46-1/8(W) x 52-9/16(H) x 25-15/16(D) inches
Weight of main unit
SD-P452 (model with doors) .... 100kg (220 lb 8 oz)
SD-P452 (model without door) .... 89kg (196 lb 4 oz)
SD-P502 (model with doors) .... 117kg (258 lb)
SD-P502 (model without door) .... 104kg (229 lb 5 oz)

ACCESSORIES

Operating Instructions 1
Remote control unit operating instructions 1
Warranty card 1
Remote control unit 1
AM-3, "AA" size (IEC LR6 1.5V) Alkaline dry cell
batteries 2
Safeguard Card 1

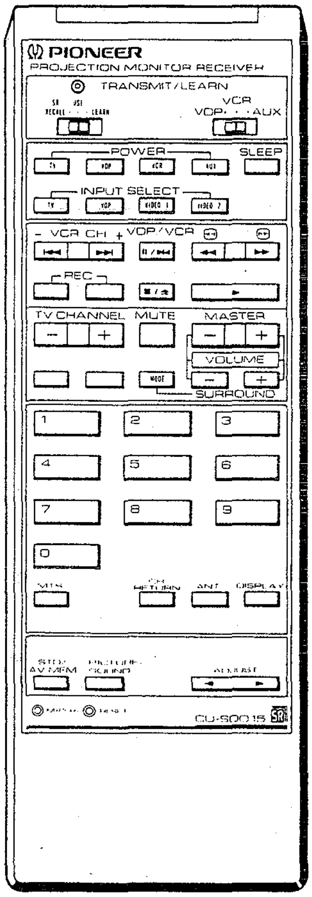
NOTE:
Specifications and design subject to possible modifications without notice due to improvements.

SD–P502–QD

PIONEER
The future of sound and vision.

CU-SD015

AUDIO VIDEO PROGRAMMABLE REMOTE CONTROL UNIT
BOITIER DE TELECOMMANDE PROGRAMMABLE AUDIO-VIDEO


PIONEER
PROJECTION MONITOR RECEIVER
TRANSMIT/LEARN
VCR
VDP
AUX
POWER
SLEEP
INPUT SELECT
VCR CH
VDP/VCR
REC
TV CHANNEL
MUTE
MASTER
VOLUME
SURROUND
MODE
1
2
3
4
5
6
7
8
9
0
CH RETURN
ANT
DISPLAY
STO/AV MEM
PICTURE/SOUND
ADJUST
CU-SD015

Operating Instructions
Mode d'emploi

Introduction

Thank you for choosing Pioneer to meet your home entertainment system needs. Through using the diverse functions of the accompanying remote control unit, you will undoubtedly discover that with it you have a small piece of equipment that provides a very large boost to your enjoyment of home audio and video.

It can only be effective, however, if your components have functions that correspond to its keys and are infrared remote-controllable.

Contents

Handling the Unit 2
Basic Operation 3
Projection Monitor Operation 4
VDP Operation 6
VCR Operation 7
Programming Commands 8
Specifications 11

Handling the Unit

Effective Range

The unit may be used from anywhere within approximately 6 meters (20 feet) from the remote sensor, of the receiving component within angles of approximately 30° on either side of the sensor. (The front of the unit should be pointed at the front panel of the receiving component.)

NOTE:

These figures are general and do not necessarily apply to programmed commands.

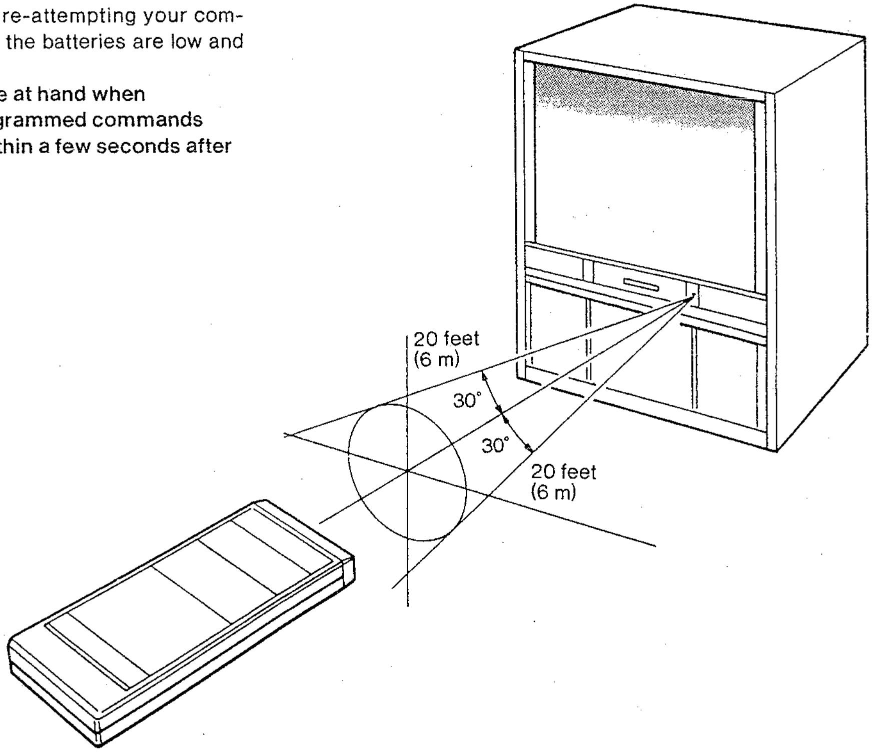
Battery Replacement

If the TRANSMIT/LEARN indicator does not light when you press a key, try pressing RESET button and re-attempting your command. If the indicator still doesn't light, the batteries are low and should be replaced as soon as possible.

Be sure to have the new batteries close at hand when replacing worn out ones, because programmed commands might be lost from the unit memory within a few seconds after the batteries are removed.

NOTE:

- *As the unit power switch is connected to the battery compartment cover, the unit will not operate without the cover even if the batteries are loaded, and memory will only be retained for approximately 30 minutes (if the batteries are loaded).*
- *Never close the cover when the batteries are not loaded. The programmed commands will be lost within a few seconds if you do so.*



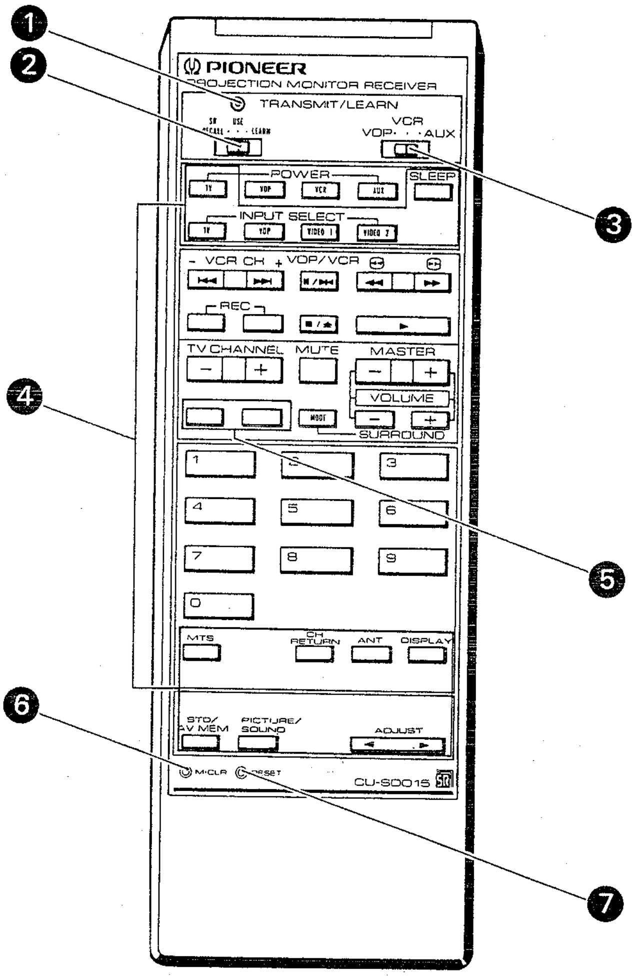
BASIC OPERATIONS

Besides controlling your projection monitor, the Pioneer Programmable Remote Control Unit can also control any audio or video appliance that has an infrared remote control unit, when you follow the simple procedure of programming its remote control commands into it. Moreover, any LD Player, VCR, or audio component bearing the Pioneer SR mark can be operated with this unit with no additional programming.
Before you begin, please read the following basic operating instructions carefully and familiarize yourself with the functions of the CU-SD015.

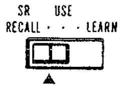
❶ TRANSMIT/LEARN Indicator

Flashes when commands are being sent in the USE or SR RECALL modes of the LEARN MODE selector. In the LEARN mode, however, it:

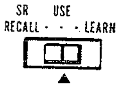
- lights when ready to accept programming information, and
- flashes to signal that you have chosen an incorrect key to store a command you wish to program or when the memory is full.


❶
❷
❸
❹
❺
❻
❼
PIONEER
PROJECTION MONITOR RECEIVER
TRANSMIT/LEARN
SR USE
RECALL · · · LEARN
VCR
VDP· · ·AUX
POWER
TV
VDP
VCR
AUX
SLEEP
INPUT SELECT
TV
VDP
VIDEO 1
VIDEO 2
- VCR CH +
VDP/VCR
REC
TV CHANNEL
MUTE
MASTER
VOLUME
MODE
SURROUND
1
2
3
4
5
6
7
8
9
0
MTS
CH RETURN
ANT
DISPLAY
STD/ AV MEM
PICTURE/ SOUND
ADJUST
M-CLR
RESET
CU-SD015

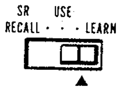
❷ LEARN MODE Selector


SR USE
RECALL · · · LEARN

Set here to command Pioneer equipment marked with the SR mark. (No memory function)


SR USE
RECALL · · · LEARN

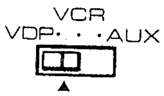
In this mode the remote is able to command other components with commands you input through the LEARN function as well as Pioneer SR equipment.


SR USE
RECALL · · · LEARN

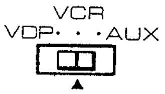
This setting activates the capability of the unit to "learn" and store command codes from other remote control units.

❸ TRANSMIT MODE Switch

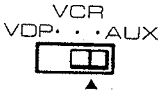
Set to the position that corresponds to the component you wish to operate.



To control the LD Player



To send commands to the VCR



To transmit "learned" commands

❹ These keys are for use only in operation of the projection monitor, and cannot be used to store commands from other remote control units.

❺ Excess Storage Keys

These keys have no set function, and will hold one programmed command each when all the other eligible keys are occupied.

❻ M-CLR Button

Erases all commands programmed through the LEARN function; press lightly with the tip of a fine-point pen or other fine-tipped instrument to activate.

❼ RESET Button

If, during programming of a command you store it with a key other than that with which you wanted to store it, this button will clear just that mistake so you may correct it.

NOTE:
Very occasionally, an electrical discharge may occur inside the unit, causing some command malfunction. In the event of such an occurrence, pressing RESET should correct the problem. The possibility exists, however, that instead of correcting the problem, pressing RESET may erase the entire programmed memory.

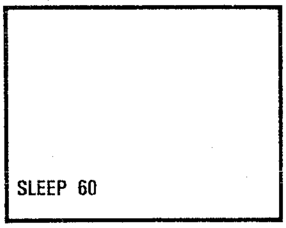
PROJECTION MONITOR OPERATION

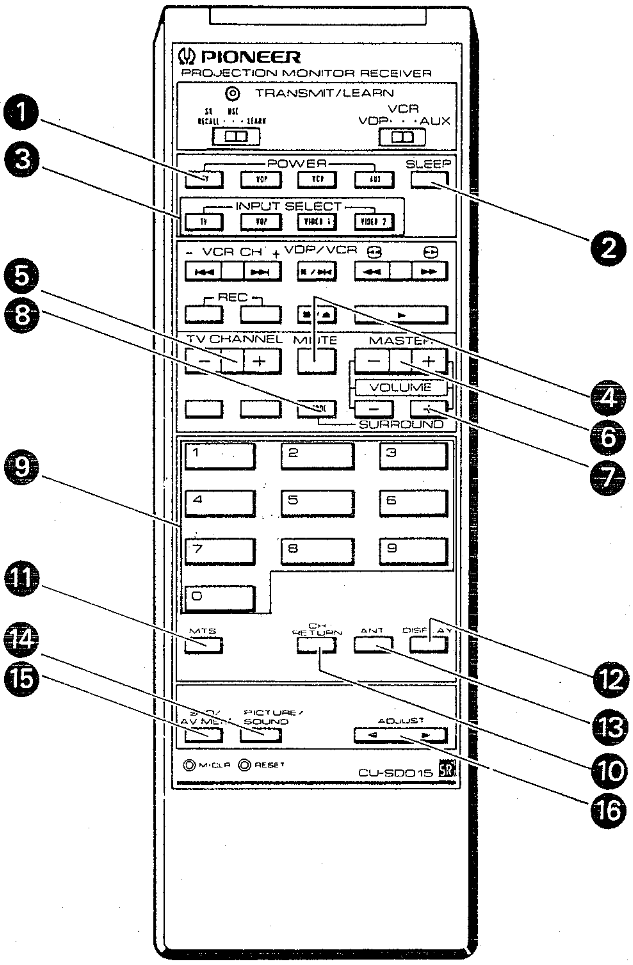
❶ TV POWER

Press once to turn on the projection monitor, press again to turn it off.

❷ SLEEP

Press to set the sleep timer.
The switching sequence (in minutes) is 90, 60, 30 and OFF (cancel). The screen will confirm your setting and the projection monitor will shut down when that amount of time has elapsed.

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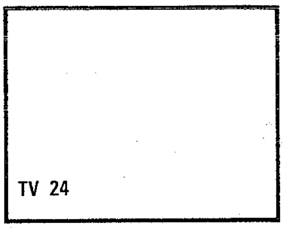
PIONEER
PROJECTION MONITOR RECEIVER
TRANSMIT/LEARN
VCR
VDP AUX
POWER
SLEEP
INPUT SELECT
VCR CH
VDP/VCR
REC
TV CHANNEL
MUTE
MASTER
VOLUME
SURROUND
1
2
3
4
5
6
7
8
9
0
MTS
CH RETURN
ANT
DISPLAY
AV MEM
PICTURE/SOUND
ADJUST
M-CLR
RESET
CU-SD015

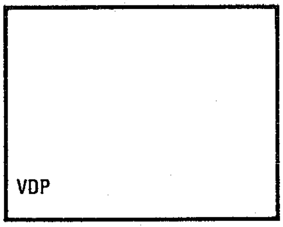
❸ INPUT SELECT

Press the key for the source you wish to watch. The screen will display your selection in the following manner:

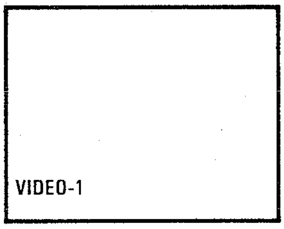
When you select TV



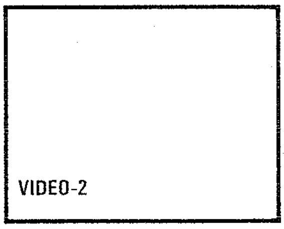
When you select LD Player



When you select VCR 1



When you select VCR 2



❹ MUTE

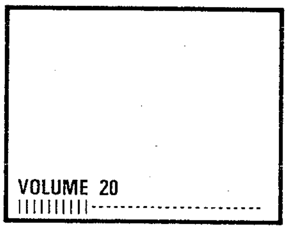
Press to temporarily turn off the sound, and again to return to the previous volume level. This comes in handy, for example, when you get a phone call.

❺ TV CHANNEL

Press the right (+) or left (–) side of this key to scan up or down among the channels in channel memory.

❻ VOLUME

Press the right side (+) to increase the volume, the left side (–) to decrease it. The screen shows your setting as a number and a line of blocks.



❼ SURROUND VOLUME keys

Press the plus (+) key to increase volume in the surround mode, and the minus (–) key to decrease surround volume.
When surround mode is OFF, these keys do not work at all.

❽ SURROUND MODE key

Press to select the surround mode of sound reproduction. Your choices revolve in a loop sequence as follows:

→ DOLBY SURROUND → STADIUM
OFF ← SIMULATED SURROUND ←

❾ Direct Channel Selection Pad

Press the key (or keys) that correspond to the channel that you wish to watch, to turn directly to that channel from any other channel.

❿ CH RETURN

Press to switch between the current channel and the previous channel you were watching immediately. This is useful, for example, if you wish to switch back and forth between two sporting events.

⓫ MTS (stereo)

Press to select the reception mode for multichannel TV sound (MTS).
The switching sequence is as follows:

MAIN → SAP → MAIN/SAP → MONO

⓬ DISPLAY

Press once to show the current channel and/or other information on the screen, and again to delete the display.

⓭ ANT

Press to switch between the sources you have connected to the ANTENNA-1 and ANTENNA-2 terminals. This is convenient, for instance, in switching between regular broadcast TV and cable TV.

ANT-1 → ANT-2

⓮ PICTURE/SOUND

Press to select the picture or sound parameter to be adjusted.

→ COLOR → TINT → CONTRAST
BASS/TREBLE ← SHARPNESS ← BRIGHT

⓯ STD/AV MEM (Memory)

Press to switch between the standard (STD) picture/sound settings and your AV MEMORY 1 and AV MEMORY 2 settings.
This switch only recalls settings stored in AV MEMORY; to put a current picture/sound setting into AV MEMORY, refer to the projection monitor instruction manual.

STD → AV MEMORY-1 → AV MEMORY-2

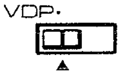
⓰ ADJUST

Press the right side of this key to increase the value of the item currently selected by the PICTURE/SOUND key, and the left side of the key to decrease it.

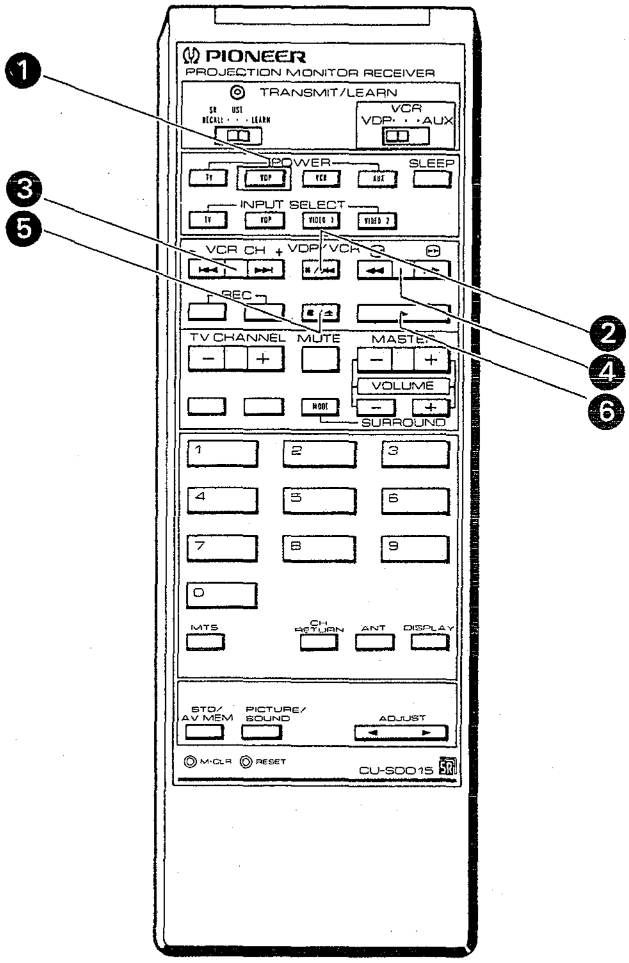
VDP OPERATION

If your VDP is a Pioneer LD Player bearing the marking SR, your programmable remote control unit has all the operation commands preset in its memory, so you don't have to program them.

To operate the LD Player, first set the TRANSMIT MODE selector to the VDP position.



Next, press VDP POWER and VDP INPUT SELECT.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PIONEER
PROJECTION MONITOR RECEIVER
TRANSMIT/LEARN
SR RECALL
UST
LEARN
VCR
VDP· · ·AUX
POWER
SLEEP
TV
VDP
VCR
AUX
INPUT SELECT
TV
VDP
VIDEO 1
VIDEO 2
VCR CH
VDP/VCR
REC
TV CHANNEL
MUTE
MASTER
VOLUME
MODE
SURROUND
1
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3
4
5
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7
8
9
0
MTS
CH RETURN
ANT
DISPLAY
STO/ AV MEM
PICTURE/ SOUND
ADJUST
M-CLR
RESET
CU-SD015 SR

❶ VDP POWER

❷ PAUSE

Press to interrupt disc play. Picture and sound vanish until you press this key again.

❸ CHAPTER SKIP

Press the right side of this key to move directly to the start of the next chapter; press the left side to move directly back to the start of the chapter currently in play. This works only with LD Players that have chapter skip capability.

❹ SCAN

Press to conduct high-speed visual scanning; pressing the left side of this key scans backward, and the right side scans forward.

❺ STOP/EJECT

Press once to stop playback, again to eject the disc.

❻ PLAY

Press to begin playback.

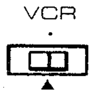
Note:
The input selector must be set at "VDP" to watch LaserVision discs.

- *from the remote controller .... Press the VDP key in the INPUT SELECT section.*
- *from the projection monitor .... Press the INPUT selector until "VDP" appears in the corner of the screen.*

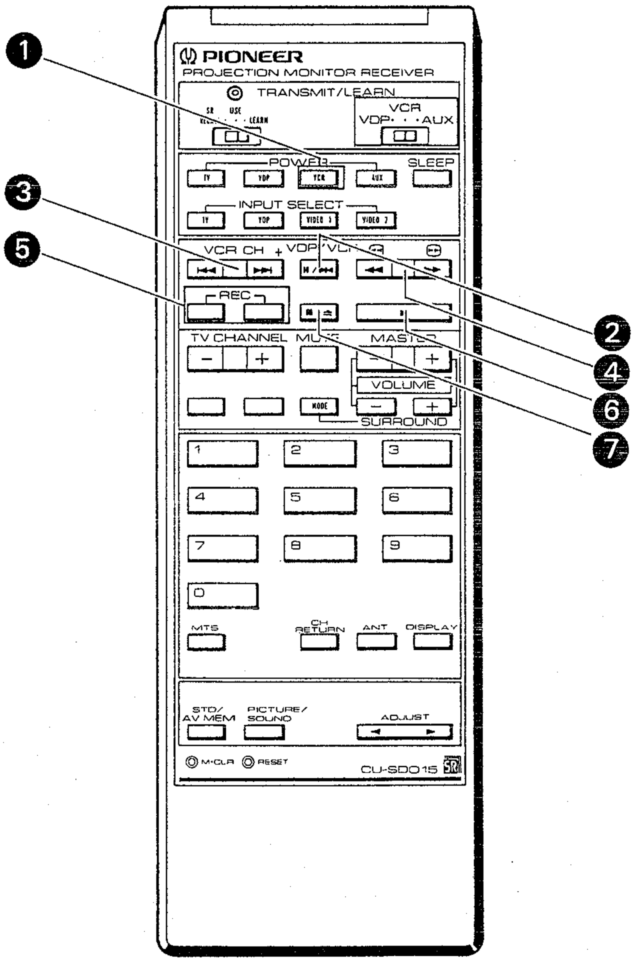
VCR OPERATION

If your VCR is a Pioneer model bearing the marking SR, your programmable remote control unit has all the operation commands preset in its memory, so you don't have to program them.

To operate the VCR, first set the TRANSMIT MODE selector to the VCR position.



Next, press VCR POWER and VCR INPUT SELECT.


PIONEER
PROJECTION MONITOR RECEIVER
TRANSMIT/LEARN
SR
USC
LEARN
VCR
VDP
AUX
POWER
TV
VDP
VCR
AUX
SLEEP
INPUT SELECT
TV
VDP
VIDEO 1
VIDEO 2
VCR CH
VDP/VCR
REC
TV CHANNEL
MUTE
MASTER
VOLUME
MODE
SURROUND
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2
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8
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0
MTS
CH RETURN
ANT
DISPLAY
STD/ AV MEM
PICTURE/ SOUND
ADJUST
M-CLR
RESET
CU-SD015
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① VCR POWER

② PAUSE/STILL

Press once to obtain a still picture during playback; keep depressing to advance frame by frame.

③ CHANNEL

Press to select channels on the VCR.

④ REW/FF

This key allows high-speed movement through parts of the tape that you don't wish to watch. Press the left side of the key to rewind the tape, and the right side to advance.

During playback you can use this key to search visually forward or backward in the same way as you would use it to rewind. Search continues until you release the key.

⑤ REC

Press these two keys together to begin recording.

⑥ PLAY

Press to begin playback.

⑦ STOP

Press to stop the tape.

Note:
The input selector must be set at "VCR" to watch videocassettes.

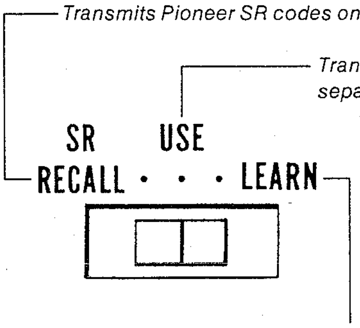
- *from the remote controller................Press the VCR key in the INPUT SELECT section.*
- *from the projection monitor..................Press the INPUT selector until "VCR" appears in the corner of the screen.*

PROGRAMMING COMMANDS

Introduction

This remote control unit can "learn" the commands of other ones, regardless of their manufacturer, as long as the other unit is of the infrared type. In some cases you may still need the original remote control unit, but you will be able to use this unit for most of your video as well as audio system control needs.

NOTE:
It is advisable to program the unit in a separate room from the system with which it is to be used. This will prevent problems such as sudden high-volume output or accidental tape erasure that may occur if command signals reach your components during programming. Or, you may wish to unplug your component system and conduct programming in the same room. Simply turning off the power may not be sufficient since power on/off switching may also be remote controllable. Also do not throw away the original remote control units after programming. You might need the original ones in the future.



Transmits Pioneer SR codes only.

Transmits Pioneer SR or separately programmed codes.

Recieves codes input during programming from other remote control units.

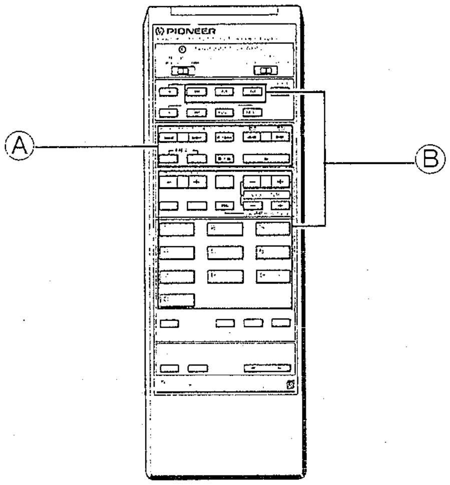
Which keys can be programmed with new commands?

Setting the LEARN MODE selector to the LEARN position allows the unit to memorize codes. Once programmed, these new commands can be transmitted only when the LEARN MODE switch is in the USE position. The SR RECALL setting will only allow transmission of the initialized Pioneer SR codes.

For VDP/VCR controls in the area indicated A, the keys can be programmed with commands from other remotes depending on the TRANSMIT MODE. In other words, each key can change its functions up to three different ways according to the setting of the TRANSMIT MODE.

For POWER and other TV controls in the area B, each key can be programmed with only a single command, regardless of the TRANSMIT MODE setting.

This remote control unit contains preprogrammed commands compatible with Pioneer equipment. If your home audio/video center consists exclusively of Pioneer components, you can use the unit without any additional programming. It is also possible to return to the original Pioneer commands after assigning other commands. (Refer to "Returning to the Initial Settings" for details.)



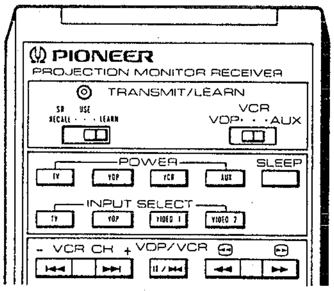
Other Important Notes

- A total of 47 keys may be used for memorization of other codes.
  (This may vary depending on the command format of the codes to be memorized.)
- There are 2 keys on the unit for recording, to help prevent misoperation. To start recording, or to memorize a command code with the REC keys, both of them must be pressed at the same time.
- When the batteries run down, all functions will stop automatically. If the indicators no longer light or flash, or components do not respond to signals from the unit, the batteries need to be replaced. (Always use alkaline cells.)
- When programming keys, make sure that both units are loaded with fresh batteries.
- Programming may be impossible from some types of infrared remote control units.

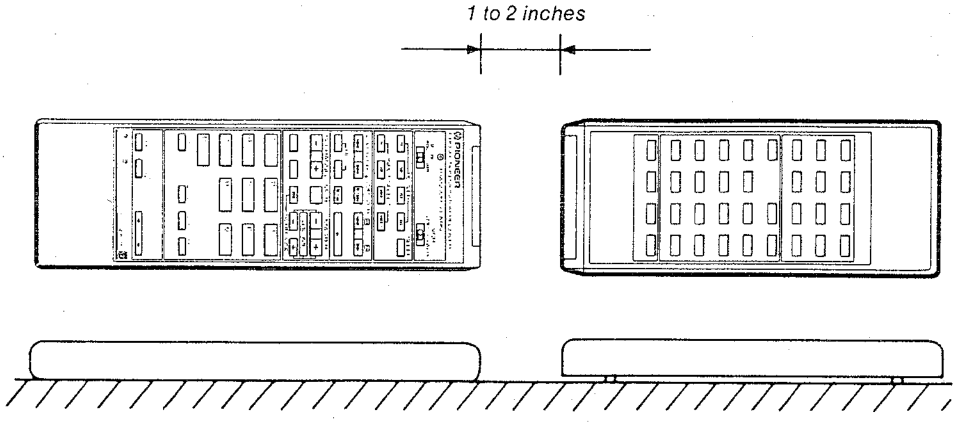
Example

Programming the playback command from the remote control unit of your VCR:

❶ **Set the LEARN MODE selector to LEARN position and the TRANSMIT MODE switch to VCR position.**
(Programming is possible in either transmission mode; video is used here as an example.)



❷ **Place the signal transmission areas of the two remote control units on a flat surface facing each other, approximately 2 to 5 cm (1 to 2 inches) apart.**



NOTE:
Memorization will not be possible if the units are too close to each other.

❸ **Press and hold the PLAY key of the programmable remote control unit until the TRANSMIT/LEARN indicator lights up.**

❹ **Press and hold the PLAY key of the VCR remote control unit.**

❺ **Release the VCR remote play key when the TRANSMIT/LEARN indicator goes out on the programmable unit.**

NOTE:
If the LEARN indicator flashes, it indicates either that you are trying to store a command with a key incapable of being used in the LEARN function or that programming capacity has been exceeded. In the latter case, the function programmed last will not be stored correctly. All previously programmed functions, however, will be retained in the memory and may be used as they are if the last function is not essential.
For re-programming information, refer to page 10, "Returning to the Initial Settings."

❻ **Repeat steps 3 to 5 until programming of the other commands is completed.**

❼ **Set the LEARN MODE selector of the programmable unit to the USE position.**
- Any previously programmed codes will be replaced by those you have just programmed.

❽ **Test the new codes to make sure they work.**
- If the VCR does not respond to commands you send, check the angle, positioning and distance between the two remote control units and repeat the programming procedure.

NOTE:
- *When programming, make sure that function indications (i.e. ▶, ▶▶, ■) are programmed from the original remote control unit into the matching keys of the programmable unit; this will greatly facilitate operation.*
- *Do not use excessive force in pressing the keys.*

Questions and Answers on Programming Commands

Q: The remote control unit for my VCR has two REC keys, which both have to be programmed at the same time to start recording. How should I program this into my programmable remote control unit?

A: Press and hold both REC keys on the programmable remote control until the TRANSMIT/LEARN indicator lights up, and then press the two keys on the VCR remote control simultaneously.

Q: The remote control unit of my VCR has a REC key and a PLAY key, and they both have to be pressed at the same time to start recording. How should I program this into my programmable remote control unit?

A: Press and hold both REC keys on the programmable remote control until the TRANSMIT/LEARN indicator lights up, and then press the REC and PLAY keys on the VCR remote control simultaneously.

NOTE:
If both keys are not pressed simultaneously in the above mentioned operations, the commands will not be memorized.

Battery Replacement

Replace the batteries as soon as possible if pressing the control keys does not cause the TRANSMIT/LEARN indicator to light even after the RESET button has been pressed. Learned commands will be lost from memory within a short time if batteries are removed. Therefore, have new batteries ready for replacement before removing old batteries.
Also, be sure to always use the specified batteries (LR6/AM3-alkaline batteries).

NOTE:
As the unit's power switch is connected to the battery compactment cover:

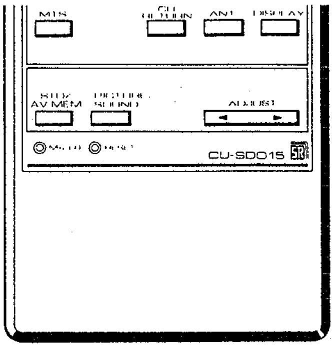
- *The unit will not operate when the cover is off even if batteries are loaded.*
- *If batteries are not loaded and the cover is replaced, the memory will be lost after a few seconds.*
- *With batteirs loaded and the cover off, memory is retained for about 30 minutes.*
- *Be very careful not to lose the battery compartment cover.*

Returning to the Initial Settings

Proceed as follows to return all settings to the Pioneer Remote Control Code Settings.

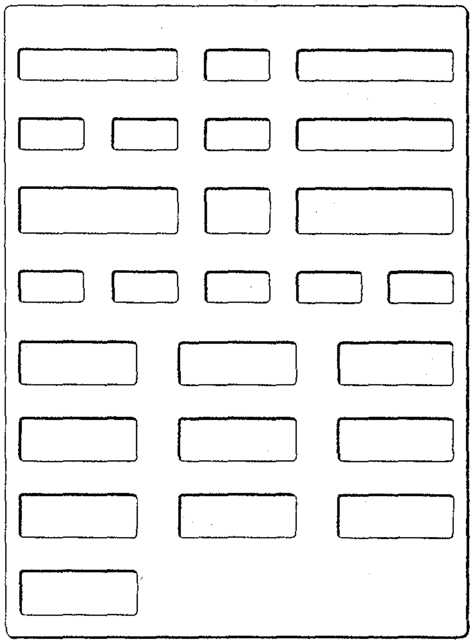
❶ Set the LEARN MODE selector to the LEARN position.
❷ Press any programmable key. (The TRANSMIT/LEARN indicator will light.)
❸ Using a ball-point pen or similar object, press and hold the M·CLR button down until the indicator flashes and then goes out.

All commands you programmed will be erased, and the unit will be reset to use the codes set by Pioneer initially.



Overlay

An overlay sheet is provided, on which you can write the functions of keys you have programmed from other remote control units and fit over the unit keyboard for your own personal reference.



SPECIFICATIONS

Operation System:	Programmable infrared remote control system
Power Source:	Two AM-3, "AA" IEC LR6 1.5 V alkaline dry cell batteries
Attachments:	Two batteries, operating instructions, a written guarantee and one overlay sheet
Dimensions:	73 (W) ×21 (H) ×218 (D) mm 2-7/8 (W) ×13/16 (H) ×8-19/32 (D) in.
Weight:	135 g (4.7 oz.) (excluding batteries)

THE SURROUND EFFECT

This unit has a built-in surround processor, adding presence and an expansive effect to the sound.

STADIUM:

Select this position when watching sports programs such as baseball game broadcasts, etc., for a stadium-like effect.

SIMULATED SURROUND:

Use this mode for monaural sources. You will obtain an expansive sound, with outstanding presence.

DOLBY SURROUND:

Choose this setting for movies (especially video tapes bearing the DD DOLBY SURROUND mark) and music playback. You will enjoy an effect similar to that of movie theaters or concert halls.

NOTE:
When using the surround effect, always set the rear panel SURROUND switch to the ON position.

Surround System Volume Balancing Procedure

1. Set the speaker selector on the front panel of the projection monitor to the INT position.
2. Play back the video source and adjust the projection monitor volume level as you like.
3. Set the speaker selector on the front panel of the projection monitor to the EXT position.
4. Set the surround switch on the rear panel of the projection monitor to the ON position.
5. Adjust the amplifier volume (front) to match that set at the rear of the projection monitor to achieve the surround effect.

Surround Speakers Installation Examples

For getting the most out of the surround system, place the speakers as shown below.

Example of a basic configuration.